

COMPUTERWORLD

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Intel sends 32-bit chips to vendors

By Clinton Wilder

Intel Corp. last week took the wraps off the initial entries in its much-heralded 32-bit product line, the 386 family.

Although mass production of the 80386 chip is not expected until late 1986 or early 1987, several vendors are expected to begin developing a new generation of computer hardware based on the Intel architecture. Representatives of a number of these commercial customers joined an Intel news conference in San Francisco last week.

Leading the parade of new Intel products was the 80386 microprocessor chip, the largest and most powerful ever made by Intel. Available now as a prototype to systems developers and expected to start shipping in volume in the second half of 1986, the 80386 contains processing power of 3 million to 4 million instructions per second.

Available in versions running at 12 or 16 MHz, the 80386 runs software compatible with all previous Intel microprocessors — the 8086, 8088, 80186 and 80286. The new chip supports simultaneous applications running on Microsoft Corp.'s MS-DOS or Xenix or on AT&T's Unix System V operating systems.

Representatives of several companies announced they have already made commitments to using the Intel chip in future product lines.

Conspicuously absent from the committed group was IBM. However, William Lowe, president of IBM's Entry Systems

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IBM token-ring net bows; software prices boosted

Tariffs hiked on 1,100
packages; end-of-year
profit relief expected

By John Gallant

ARMONK, N.Y. — Three days after confirming that its third-quarter profits were lower than those of a year earlier, IBM last week announced an average 10% price increase on more than 1,100 application and utility software packages for medium- and large-scale systems.

The price hike was the company's second major software pricing increase this year. In February, IBM increased by 7% the price of nearly all of its program products. With last Tuesday's increase, initial license charges and one-time charges for affected software rose by about 10%. Prices for program products supplied with a monthly license charge will increase by the same amount Feb. 1, 1986.

The price increase did not affect operating systems and many important systems software products such as DL/I, CICS or IMS. Analysts said that those products were spared because the cost of using them has already increased significantly over the past few years.

In its financial statement, IBM said that third-quarter profits were down 7% from those of the same period last year. For the quarter ended Sept. 30, IBM posted a \$1.47 billion profit, compared with \$1.58 billion in 1984. Revenue for the third quarter jumped by nearly 10%, from \$10.66 billion in 1984 to \$11.67 billion. Despite that rev-

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Long-awaited network
architecture connects
micros, not mainframes

By John Dix

NEW YORK — The long-awaited debut of the IBM Token-Ring network played to a packed analysts' briefing last Tuesday morning and a standing-room-only press introduction that afternoon. But users and analysts were generally unimpressed with the network, which proved to be functionally similar to the previously available IBM PC Network.

The product followed along the lines of statements of direction issued by IBM more than a year ago, but as presented, it provides only for direct connection of Personal Computers.

IBM did not reveal any plans or timetables for connecting departmental computers to the network, but the company did provide gateways to the Series 1 processor and 370 mainframe hosts.

"This is a token-passing ring implementation of the PC Network," according to Dale Kutnick, an independent consultant in Wayland, Mass. "You can't do anything on this network that you could not have done on the PC Network."

Some users were expecting nothing more of the 4M bit/sec. network. "I'm not surprised that the Token-Ring is strictly for Personal Computers because IBM is losing a lot of network business to other technologies and firms," said William J. Johnson, director of telecommunications

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Service firms in parts blockade Leading vendors take hard line on maintenance

By Clinton Wilder

For players in the fast-growing game of third-party computer maintenance, there is a major occupational hazard. In practices ranging from withholding discounts on spare parts to outrightly refusing to do business with third parties, many leading hardware vendors follow a hard line when it comes to competition against independent service firms.

Such policies can constitute a significant roadblock as the demand for third-party service grows, but most third-party vendors concede there is little they can do about the policies — except find creative ways around them.

Although some third-party vendors believe the practices unfairly infringe on users' rights to choose their own service providers, there is no trade regulation that compels hardware vendors to make parts, documentation or support materials available to their competitors in the maintenance field. "There are no specific laws

that deal with this issue," according to Richard Donahue, an attorney with the U.S. Federal Trade Commission. "The unilateral refusal to deal in any commodity has always been allowed."

The only illegal situation would be collusion among vendors in jointly agreeing not to do business with third parties, which would violate antitrust laws, Donahue said. No third-party companies have alleged such collusion, and such a hypothetical charge would be extremely difficult to prove.

The notable exception to the rule is IBM, which is required by a 1956 consent decree negotiated with the U.S. Department of Justice to provide parts and documentation to any company that wants them. In addition to the obvious attraction of IBM's huge installed base, the mandated cooperation helps account for the vast majority of third-party service dollars going to the maintenance of Big Blue boxes and

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TOP OF THE NEWS

Paul M. Villiere, executive vice-president at AT&T's Network Systems Group, said during Info '85 last week that 1984 industry modem sales matched the total of all previous years' sales. He predicted that 1987 will be the year in which corporations make volume purchases of Integrated Services Digital Network products. AT&T plans to incorporate ISDN capabilities into the company's 5ESS switch next year. For more on Info '85, see page 2.

As expected, Applied Data Research Chairman and CEO John Bennett had to field some hard questions about the current snafu at the New Jersey Department of Motor Vehicles with ADR's Ideal fourth-generation language product [CW, Sept. 30] at last week's Alex Brown & Sons computer services investment seminar in Baltimore. At least Bennett hasn't lost his sense of humor about the whole mess. He repeated a quip currently making the software industry rounds that ADR may have finally found the answer to the current

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NEWSPAPER

NEWS

Software vendors pulled heaviest Info show traffic

By Paul Korzeniowski

NEW YORK — The Information Management Exposition and Conference (Info '85) got off to a slow start on Columbus Day, but attendance picked up on the following days, despite a lack of new products.

On Tuesday morning, bus loads of data processing professionals from large New York companies like Chemical Bank and big Connecticut insurance companies like Aetna Insurance Co. were unloaded. Show aisles may not have been jammed, but booth personnel no longer had to read the paper to pass the time.

Few products were unveiled at the show (see story at right), but there was some action with voice-activated products. Data General Corp. announced voice/data capabilities for its Comprehensive Electronic Office (CEO) system. IBM also announced voice products last week (see story, page 4).

While several conference speakers commented that micro-to-mainframe links are still in their infancy, attendees were on the floor stalking the rare link.

Sara Levy of Citibank NA in New York hoped to find a way to download and upload data from her departmental IBM Personal Computers to the company's IBM 3033 and Digital Equipment Corp. VAX series machines.

Despite being hidden on the top floor of the New York Coliseum, software companies seemed to attract the most attention. Ansa Software, Inc.'s recently announced Paradox micro data base program attracted a long line of potential customers.

The range of attendees was broad, from relative novices to experienced data processing managers. For example, J. H. Pope, from the records management department at the National Center for Health Education, used the show to help determine what the company's first computer purchase would be. Pope was examining

spreadsheet and word processing offerings that would run on IBM Personal Computer ATs.

Joseph J. Surdovai, applied technologies specialist at Finance America Corp. in Allentown, Pa., was interested in the latest personal computer offerings, including the IBM Token-Ring network and Ansa's Paradox.

Thomas Finnessey of the consulting firm of Urbach Kahn & Werlin PC of Albany, N.Y., said he was looking at personal computer networking products as a result of customer inquiries to his firm. "A lot of clients are expressing interest in networking," he said, so the firm is setting up a pilot network in its own offices to link personal computers and two IBM System/34s.

The broad range of attendees concerned some exhibitors. "At a show like this, we spend a lot of our time educating users," one vendor said. "At the vertical shows, we sell more products."

In recent years, attendance at some of the broad-based shows such as the National Computer Conference has slumped. This year's Info '85 drew 22,286 attendees in its first two days, up 6% from 1984, according to show organizers.

But Robert Weltzien, president of Softran Corp. in Brooklyn, N.Y., said Info '85 was a good place to "talk to all the people who are dipping their toes into the Unix world." Weltzien's company specializes in microcomputer software running on IBM microcomputer systems under Microsoft Corp.'s Xenix, a variation of AT&T's Unix. But following conversations with representatives of Sperry Corp. and other vendors offering AT&T Unix-based systems, Weltzien said Softran will move in the direction of porting its software to AT&T Unix System V-based systems.

Contributing to this report were Mid-Atlantic Correspondent Charles Babcock and Staff Writer Donna Raimondi.

SAS, SPSS use Info forum to unveil micro software

NEW YORK — There were few major product debuts at the Info '85 last week, but two traditionally mainframe-oriented companies announced micro software offerings.

Statistical modeling software vendor SAS Institute, Inc. of Cary, N.C., announced that its SAS/FSP software, previously sold for mainframes and minicomputers, is now available for the IBM Personal Computer family.

In another move to broaden its microcomputer software offerings, SAS announced that it will make a development tool, Version 6 of SAS/AF, available at the end of December.

SAS/FSP is a full screen interactive data entry, editing and letter-writing tool. The micro version will be fully compatible with the larger system version, and a user will be able to download data sets from SAS/FSP on a mainframe to a micro, according to James Goodnight of SAS Institute. The SAS system requires a micro with a hard disk and at least 512K bytes of random-access memory (RAM).

SAS/FSP Version 6 will be licensed on an annual basis with fees based on the number of workstations used. First-year fees for corporate customers with one to 50 workstations will be \$2,000, with renewals available at lower rates.

SAS/AF will be licensed for \$1,500 at sites with one to 50 workstations, he said.

SPSS, Inc. replaced its present microcomputer statistical analysis package with three expanded modules that require more main memory and a hard disk.

The three packages, replacing SPSS/PC, are SPSS/PC+, SPSS/PC+ Advanced Statistics and SPSS/PC+ Tables. The latter two programs cannot run without the first package.

SPSS/PC+'s file and data management capabilities include the ability to work with a number of file formats such as ASCII, Micropro Inter-

national Corp.'s Wordstar and Lotus Development Corp.'s 1-2-3.

The package has data base management-like report writing capabilities and generates graphs. SPSS/PC+ Advanced Statistics' factor analysis capabilities can input correlation matrix, factor loading matrix or data files.

The third module works with stub and banner tabulations, multiple response data and presentation tables. SPSS/PC+ Tables supports descriptive statistics within tables such as means, medians, standard errors, sums and percentiles.

SPSS/PC+ represents the company's third release of its central microcomputer package. A number of new features have been incorporated into the program. A Review function supplies an on-line editor with a split screen so that users can edit jobs, compare output files and edit test data for reports.

The previous versions of the program supported only 64K bytes of RAM of work space for a file. The latest version supports work spaces of 256K bytes of RAM.

SPSS/PC+ requires an IBM Personal Computer XT or AT, 384K bytes of RAM, IBM's PC-DOS 2, 2M bytes of hard-disk storage, and the company recommends an Intel Corp. 8087 coprocessor. To run the additional modules, 448K bytes of RAM and 6M bytes of the hard-disk storage are needed, the vendor said.

SPSS/PC+ costs \$785, and the other two modules each sell for \$295. Current customers cannot upgrade from the current SPSS/PC to SPSS/PC+, but they will receive the new package if they buy one of the other two modules.

Each version of SPSS/PC+ includes Kermit, a public domain file transfer package from Columbia University. A mainframe version of Kermit is available for \$250.

— Paul Korzeniowski and Charles Babcock

NEWS SUMMARY

Rounding out its Personal Computer line, IBM offered a series of voice and telephone management add-ons as well as an enhanced version of its Displaywrite 3 word processing package/4

IBM quietly unveiled a version of CICS that operates under VM/CMS and on the Personal Computer AT/370 and XT/370/6

Apple returned to profitability in the fourth quarter, stemming its yearly decline in earnings to a modest 4.4% drop compared with fiscal 1984/8

IBM's Token-Ring network supports only Personal Computers in its initial release and provides host links through gateways/11

Both AT&T and NCR reported increases in profits and revenue, but AT&T's results were below company expectations/13

The struggle for supremacy within the

independent DBMS market continued as Computer Corporation of America unwrapped a release of its Model 204 relational DBMS/14

Prime will claim computer room powers in an office-environment computer with the announcement of a pair of systems/15

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Know any news?

Hard as we try to give our readers the most complete information available, some good news and feature stories never reach us.

Are you involved in an unusual application of data processing technology in your company?

Have you implemented successful cost-cutting strategies?

Is something in your DP shop not working as designed? Have you tried something unusual that may be useful to your peers?

Do you know any unsung heroes? Are vendors living up to their prom-

ises, and are they dealing with your major concerns?

Are you aware of technology or management trends that the trade press is overlooking?

If so, we'd like to hear from you. Computerworld has established a reader hot line for information regarding items of interest to the computing community. Call us toll free at (800) 343-6474. Ask for Peter Bartolik, news director.

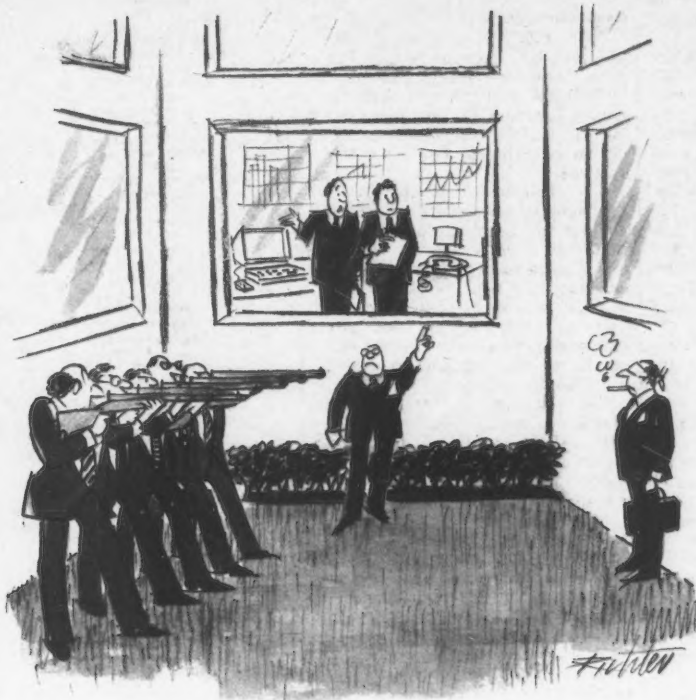
We can't be everywhere — but our readers are — and we want to hear from you directly.

CORRECTIONS

The power of personal computer power conditioners (CW, Sept. 9) from Sola Electric Co., a unit of General Signal Corp., was incorrectly listed. The PCPC 150 handles 150 VA, and the PCPC 300 handles 300 VA.

The article "Boom times seen for DSS" (CW, Oct. 7) incorrectly reported that Comshare, Inc.'s System W decision support software had lost market share in 1984. System W, in fact, recorded a significant market gain during that period.

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NEWS

From page 1

Intel sends 32-bit chips to vendors

Division, said in prepared remarks that, "While [the 80386's] use in an IBM [Personal Computer] product is not expected in the immediate future, we look forward to exploring its potential."

Among the committed customers are the following:

■ McDonnell Aircraft Flight Simulation said it selected Intel's chip and Multibus II architectures as the basis for the development of an advanced aircraft flight simulator.

■ Burroughs Corp. said it will use the 80386 in future workstations and network server systems.

■ GCA Corp. Industrial Systems Group said it would use the 32-bit chip, Intel's Multibus I and Multibus II architectures as the basis for extending GCA's factory automation products.

■ Sperry Corp. said it expected to deliver 386-based workstations in late 1986.

■ AT&T announced that it would port its Unix System V operating system onto the microprocessor.

■ Daisy Systems Corp. will use the microprocessor on its Physical Modeling Extension system.

Others that have made commitments to using the chip include Altos Computers Systems, Inc.; Convergent Technologies, Inc.; Grid Systems Corp.; and Wang Laboratories, Inc.

One company that was missing from the list of potential customers was Sun Microsystems, Inc., a rising star among workstation makers.

Sun now employs Motorola, Inc.'s 68020 chip in its Unix-based workstations. "We would wait for IBM to set a standard first before we did anything with it," Andreas Bechtolsheim, Sun's vice-president of technology, explained. Sun is also concerned about the lack of 32-bit floating-point processors. "Intel seems to be a year away from that," he said.

But, according to Intel, that technology could hit the market in six months. Through a joint marketing

agreement with the Sunnyvale, Calif.-based Weitek Corp., Intel will develop and market a chip that provides an interface between the 386 and Weitek's 1164 and 1165 64-bit floating-point devices.

According to Intel, the 80386 chip features on-chip demand paging, memory management, self-test functions and software debugging. The 32-bit registers and data paths can support 32-bit, 16-bit or 8-bit addresses and data types.

The chip costs \$299, down slightly from the initial \$360 price of Intel's 8086 and 80286 chips when they were introduced. The 80386 offers superminicomputer-type performance at an approximate price of \$75 per MIPS, according to David House, vice-president and general manager of Intel's Microcomputer Group.

William F. Zachmann, vice-president of International Data Corp. in Framingham, Mass., called the new Intel chip "a high-end, expensive product." He predicted the rumored IBM engineering workstation will still be based on the existing Intel 80286 chip. "Intel is a good company but has a history of late deliveries," Zachmann said. "I wouldn't expect a 386-based system until the second half of 1986."

With a maximum addressable memory of 4G bytes of main and 64 terabytes of virtual memory, the 80386 is targeted at the engineering, telecommunications and sophisticated office automation applications markets, House said.

Based on Intel's high-performance CMOS technology, the 80386 reportedly packs more than 275,000 transistors on the chip. A local bus provides a bandwidth of 32M bytes per sec.

Intel also announced two board-level products, the ISBC 386/20 Multibus I and 386/100 Multibus II; assembler and system utilities; and C and PL/M programming languages for the 386. The 80387 floating-point math coprocessor and other 386 software will be unveiled in 1986.

Contributing to this report were West Coast correspondents Maura McEnaney and Peggy Watt.

Phone, voice aids run on IBM micro

By Eric Bender

NEW YORK — A series of voice and telephone add-ons for the Personal Computer line were announced by IBM last week, along with an enhanced Displaywrite 3 word processing package that provides smoother document exchange with other IBM systems.

The Personal Computer Voice Communications Option, a \$1,250 adapter card, supports voice recognition, voice storage, voice synthesis, telephone management and modem emulation functions. Combined with suitable software, the option permits users to operate application programs with voice commands or to set up micros as telephone answering machines.

The Telephone Access to Office Systems package, \$250, allows users with a tone-generating phone and a Personal Computer XT or AT to access data in office applications that is output with voice synthesis.

"IBM decided to do something useful with voice" by creating links into an overall office system, and is likely to offer voice services elsewhere in its product line, said Tom Billadeau, president of TRB & Associates in Ogunquit, Maine.

Other software applications include the \$99 Voice-Activated Keyboard Utility, which supports voice commands for applications; the \$149 Voice/Phone Assistant, which lets the micro act as an advanced telephone answering machine; the \$70 Personal Telephone Manager Program/Voice Communications Option, which automates telephone functions; and the \$149 Augmented Phone Services package, which lets individuals with hearing or speech impairments communicate on the phone by typing their messages, which are converted to synthetic speech. A Voice Communications Application Program Interface Reference for programmers costs \$149.

Compatible with the Personal Computer, Personal Computer XT and AT, most of these products are shipping now. Personal Telephone Manager Program/Voice Communications Option and Telephone Access to Office Systems will be available in December, while the Augmented Phone Services package will be offered next month.

IBM also is selling the Personal Telephone Manager program with another adapter card, providing phone directory and dialing features. The program and adapter cost \$70 and \$325, respectively, and are available immediately.

Displaywrite 3 Version 1.1 can automatically convert text to and from reversible-form and final-form text formats, IBM said. This will make document exchange simpler with other IBM machines, like the System/36, that support those Document Content Architecture formats.

Additionally, the new release supports the Proprinter, Model 2 Color Jetprinter and Model 2 Quietwriter Printer. The program costs \$450, and Version 1 users may upgrade for \$35.

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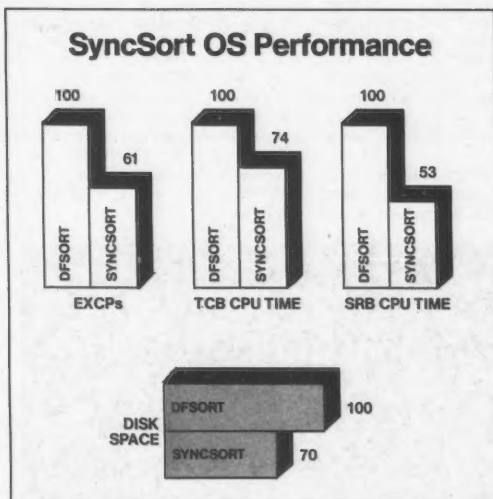
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NEWS

IBM offers CICS teleprocessing monitor for VM/CMS

CICS/CMS version allows for leverage into CMS component

By John Gallant

Amid the din of local-area network pyrotechnics last week, IBM quietly introduced a version of its widely installed CICS teleprocessing monitor that allows users to develop CICS applications interactively under VM/CMS.

IBM's CICS/CMS was met with enthusiasm by analysts who said the product allows CICS applications programmers to leverage for the first time the development tools within the CMS component of the VM operating system. CICS/CMS also runs on the IBM Personal Computer AT/370 and XT/370 — a capability some observers said could transform those machines into useful development workstations.

According to Thomas Foth, a member of the senior technical staff of Adesse Corp., a Ridgefield, Conn.-based VM software house, CICS/CMS opens up a new development environment for CICS, which is the foundation for on-line applications in more than three quarters of all IBM mainframe shops.

"CMS is the perfect environment for developing CICS applications," he said. "It is highly isolated because it

is in a virtual machine environment, and it is highly tuned for that type of work. Finally, you can exploit CMS for one of the most fundamental things people are doing — transaction-oriented applications development."

Previously, Foth said, users could not run CICS under VM/CMS without modifying the teleprocessing monitor. Some CICS users — a total of more than 16,000 at year-end 1984, according to market research firm International Data Corp. (IDC) — braved those unsupported modifications in order to use CMS for CICS development. But, Foth said, many were waiting for IBM to announce a supported product.

"This is an exciting announcement," Foth said. "But it is disappointing that it took so long for IBM to make it. It has been many years since the user community demonstrated that this could be done."

The debut of CICS/CMS gives yet another boost to VM, which rapidly is becoming one of IBM's most important software offerings. Already this year IBM has introduced an AT&T Unix system to run under VM, IX/370; an extended architecture VM of-

fering; and an entry-level version, VM/Entry, for smaller machines. Analysts said that last week's announcement could spur an even faster growth in VM installations.

"IBM is moving more and more mainline programs into VM," said John King, executive director of the

San Jose, Calif.-based James Martin Associates consulting firm. "This will continue to boost the popularity of VM, which may end up being IBM's answer for the future of all its systems."

Analysts said

CICS/CMS — which allows a user to edit, translate, compile and test initially CICS command-level Cobol, PL/I and assembler applications under CMS — will significantly pare development time.

"The product should open up a quicker overall response in developing CICS applications," said Christopher Gruchawka, senior technical manager with the Bogota, N.J.-based CICS consulting and education firm Interactive Solutions, Inc. "It will also limit the impact of testing. Before, a bad test could bring down a whole CICS region. Now, the exposure will only be for the particular CMS user and not [for] all the users within a region."

CICS/CMS offers interfaces to production data in other systems, such as the DL/I and IMS data base man-

agement systems, and provides a pseudo-VSAM facility that allows a user to test VSAM file requests. Those capabilities and other testing tools make it simpler for a developer to put a CICS application through tests within CMS before it is ported to a production environment.

Perhaps more important for the future is that CICS/CMS runs on the Personal Computer AT/370 and XT/370. The current capabilities of those machines — CICS/CMS requires 20M bytes of fixed-disk storage — may limit their functionality as CICS development nodes, analysts said. And CICS/CMS' \$15,000 price tag may seem too high for some potential workstation users. But IBM seems to have given the nod to the programmer workstation concept.

"This could be a very impressive workstation environment for developing CICS programs," said Ed Acly, a senior consultant with IDC's User Services group. "IBM seems to be giving a programmer a full environment for off-loading development from the mainframe. The workstation is a much more efficient approach to developing systems."

Foth agreed. "IBM seems to be saying it understands the importance of programming on [Personal Computers]. But it will have to improve those machines. If IBM could provide [its] VS Cobol II [compiler] and [CICS/CMS] on a more powerful system, you would have the dream workstation."

CICS/VM is scheduled to be shipped in June at a monthly charge of \$835 or at a one-time charge of \$15,000.

”

'CMS is the perfect environment for developing CICS applications.'

— Thomas Foth
Adesse Corp.

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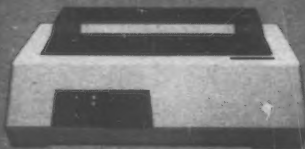
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NEWS

From page 1

Tariffs hiked on 1,100 IBM packages

enue hike, which IBM attributed to a strong growth in orders for high-end processors and storage equipment, earnings per share fell by nearly 8% to \$2.40 from \$2.60 for the same period last year.

Weak dollar, slow shipments blamed

IBM blamed the weak dollar and slower than expected high-end processor shipments earlier in the year for a more than 12% year-to-date drop in profits from 1984. For the nine months ended Sept. 30, IBM posted a \$3.87 billion profit, compared with \$4.41 billion for the same nine-month period last year. That profit dip resulted in a 12.6% drop in earnings per share, from \$7.22 for the same period in 1984 to \$6.31. IBM's revenue for the year to date was \$32.9 billion, representing less than a 5% increase over the \$31.4 bil-

MITCHELL J. HAYES

al Data Corp., the price hike will have a real impact on users. "I am sure IBM is passing on legitimate costs, but they hurt," he said. "A 10% hike over the life span of multiple products really increases the software bill for most users."

In addition to raising prices, IBM made 262 programs, formerly supplied only through monthly licenses, available for a one-time charge — in effect, offering them for sale rather than lease. While that option may serve to bolster fourth-quarter results immediately, Djurdjevic said, IBM may be mortgaging its future to pay for the present (see chart).

"IBM did this last year for a much smaller number of software products," he said. "I think that paved the way in large measure for the huge drop that IBM had in first-quarter 1985 earnings."

But Michael Geran, vice-president of research with E. F. Hutton & Co. in New York, disputed Djurdjevic's claim. "Over the last five years, IBM has increased the functionality and price of this labor-intensive product called software. This is just a continuation of that trend, and it has nothing to do with the fourth quarter," Geran said.

Analysts said software costs will continue to increase as that segment of IBM's business becomes an ever more important contributor to the company's bottom line. "This is clearly an extension of IBM's strategy to gain a more significant portion of its total revenue from software," Rinaldi said. "IBM has a solid lock on its customers. As much as you hear about software alternatives, the wind blows the way IBM says it does."

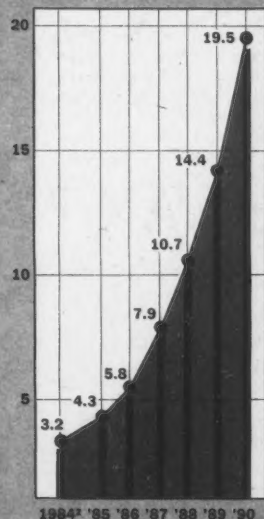
Price changes

Below are some examples of IBM's new pricing structure, which affects 1,115 application and utility packages.

■ The initial license charge for the Professional Office System, IBM's office offering for VM, increased from \$4,280 to \$5,000.

■ Version 2 of the Distributed Office Support System/370 had a monthly license charge of \$1,215, based on option selection. That cost will be \$1,335 starting Feb. 1.

■ The monthly fee for the Capacity Requirements Planning module for the IBM System/38 Mapios tool went from \$204 to \$234.

Projected IBM software revenue¹Revenue
(In Billions)

¹ Based on 35% compound annual growth
² Estimated

Source: Annex Research

Observers said the pricing move was aimed at brightening IBM's fourth-quarter financial picture.

lion figure reached in the third quarter of 1984.

A few industry analysts said the software cost increases announced in the wake of the financial results were simply part of a longer term upward trend in IBM software costs. But most observers agreed that the move was aimed more at brightening the fourth-quarter financial picture.

"This is exactly what IBM did at this time last year to boost its fourth-quarter earnings," said Bob Djurdjevic, computer industry analyst and president of Phoenix-based Annex Research.

'Legitimate costs, but they hurt'

According to Damian Rinaldi, director of the Software and Services Information Program at International



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NEWS

Apple ends year on upturn, but Lotus profits decline

By Clinton Wilder

Apple Computer, Inc. returned to profitability in the fourth quarter ended Sept. 27, stemming its yearly decline in earnings to a modest 4.4% drop compared with fiscal 1984.

But Lotus Development Corp. reported a 30% drop in profits for its third quarter compared with the same period a year ago.

Apple ended the most tumultuous year in its history with a 27% revenue gain over fiscal 1984, with total revenue of \$1.92 billion. Although profits dropped from \$64 million, or \$1.05 per share, to \$61.2 million, or 99 cents per share, Apple President and Chief Executive Officer John Sculley was optimistic that the firm has turned the corner from its \$17.2 million third-quarter loss.

"It's working," Sculley said of Apple's massive reorganization that cost 1,200 jobs and closed three plants. "These financial results offer the most compelling evidence possible that the steps we've taken to streamline the company are producing results faster than anyone thought possible last summer."

Sculley attributed Apple's respectable fourth-quarter sales to its traditionally strong markets — education and retail dealers.

Apple's revenue in the fourth quarter was \$409.7 million, a 14.2%

decline from \$477.4 million in the year-earlier quarter but a significant rebound from its disastrous dip in sales to \$375 million in the previous quarter ended in June.

Profits were \$22.3 million, or 36 cents per share, down 27.4% from \$30.8 million, or 50 cents per share, in the fourth quarter of 1984. A spokesman for Cupertino, Calif.-based Apple said the firm's 46% gross profit margin in the fourth quarter was its highest in nine quarters.

At Lotus, third-quarter earnings fell to \$6.3 million, or 39 cents per share, from \$9.1 million, or 57 cents per share, in the year-earlier quarter. Revenue grew 9%, from \$45.6 million to \$49.7 million.

Despite the drop in profits from second-quarter levels of \$10.7 million, or 65 cents per share, Lotus President Jim P. Manzi said the company successfully contained expenses during the quarter. Third-quarter expenses were \$29.6 million, compared with \$30.4 million in the second quarter, he said. Revenue, however, fell 16% from \$59.3 million in the quarter ended in June.

Manzi said that "expenses associated with major strategic initiatives" knocked down third-quarter earnings for the Cambridge, Mass., microcomputer software leader.

TOP OF THE NEWS

Continued from page 1

CPU capacity glut that has slowed the demand for new hardware. "The joke goes, 'Just buy Ideal; it'll eat up anything,'" Bennett said.

Software Publishing Corp. will combine two more pairs of programs from its PFS line of microcomputer software into single modules sometime next year. The successful Mountain View, Calif., vendor of low-end offerings for IBM and Apple Computer machines will combine its PFS:Graph business graphics with PFS:Plan spreadsheet and its PFS:File data base management system with PFS:Report generator. Software Publishing had previously announced its combination of word processing and spelling checker programs. "Our shelf space is getting squeezed," said President and CEO Fred Gibbons.

Even the recent multimillion-dollar acquisition of Informatics General has not satiated Sterling Software's appetite for new companies. Sterling will shortly add another banking software developer to its stable of traditionally smaller acquisitions, according to President Sterling L. Williams.

Don't look for products using the technology in the very near future, but researchers at MIT claim to have produced the smallest transis-

tors ever made of silicon and, possibly, of any other semiconductor. The metal oxide semiconductor field effect transistor, or Mosfet, developed using X-ray lithography in the MIT Department of Electrical Engineering and Computer Science, features a channel length of 600 angstrom — about 2 millionths of an inch. According to MIT, the transistors now in commercial use are 17 times the size of the Mosfet.

During development work, the transistors displayed velocity overshoot — also called ballistic transport — where electrons move along a small channel length without colliding with the atoms of the semiconductor material. Velocity overshoot could mean a higher frequency of operation, according to MIT. The researchers have returned to work to reduce the amount of impurities in the transistors and raise the temperatures at which they operate.

Those looking for a little more insight into the future direction of IBM's Token-Ring network announced last week (see page 1), might find it this Wednesday morning when Bob Steen, manager of IBM's Systems Network, is scheduled to address the Localnet '85 show at the New York Hilton. Steen reportedly will discuss the actual product announcement and future developments.

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For more information, or to schedule an appointment with Craig Conway, Oracle's VP of Corporate Sales, call 1-800-345-DBMS.

NEWS

From page 1

Net architecture does not connect mainframes

and hardware planning for F. W. Woolworth Co. in New York.

Johnson said he does not think he would buy a Token-Ring just for Personal Computers. He said he needs to interconnect micros but with departmental devices like IBM System/36s and System/38s. "I don't think IBM has its act together on departmental clusters yet," he said.

Some users said they were disappointed that the Token-Ring did not offer direct host connection or a means to support 3270-type peripherals. One user who asked not to be identified, a senior systems consultant with a Massachusetts-based life insurance company, said the gateway approach used to tie the Token-Ring to the 370 world was inadequate. "Gateways don't support the speeds I need," he said.

Lack of terminal support is discouraging to many users. "We hoped they would address 3270 devices," said Albion Fitzgerald, senior technical consultant to a campus networking project at New York University. But timing is even more critical, Fitzgerald said, and the network's protracted gestation has forced the university to seek alternatives.

Fitzgerald said he believes the IBM network announcement is too late to affect the university's plans, but he applauded IBM's endorsement of a twisted-pair wire alternative for the Token-Ring and use in its Cabling System.

After testing its feasibility, the school was proceeding with plans to connect its IBM 3278 terminals to IBM 3274 controllers over twisted-pair wire. Now the university can do that with IBM's blessing and support.

Other users admitted they were treading water, waiting for IBM to make its network splash. "We've held off long-term acquisitions waiting for IBM, preferring monthly or yearly leases as opposed to long-term, three- to five-year leases," said James E. Buffington, communications specialist with Owens-Corning Fiberglas Corp. in Toledo, Ohio.

The network that some of these users were expecting may be a while in coming. "This product still does not satisfy the needs of IBM's mid- and large-scale system users — [its] main revenue source," claimed Eric Kilorin, president of Hyatt Research Corp., a research and publishing company in Andover, Mass. "Its not enough to support just Personal Computers."

As released, the IBM Token-Ring does not even measure up to the microcomputer nets of some of the competition. The most glaring hole, according to consultant Kutnick, is the lack of a file-serving provision. "Everything on the network is owned by the individual," he said. "I have to give you authorization to have access

to my files."

The open architecture of the Token-Ring may help to chink quickly these gaps. Indeed, it is the belief of Mark Stahlman, a research analyst with the Wall Street firm Sanford C. Bernstein and Co., that local networks are not a strategic priority for IBM.

"

Users were disappointed that Token-Ring did not offer direct host connection or support for 3270-type peripherals.

"IBM is not going to pursue aggressively the local network business," Stahlman said. "Instead, it will attempt to build an industrywide standard around the token ring and rely on independent network suppliers to flesh out the product capabilities."

But bringing the Token-Ring into

IBM's mainstream Systems Network Architecture (SNA) will be the mainframe maker's task, noted Dave Terrie, an independent network consultant in Boston. "IBM has the basic tools — Advanced Program to Program Communications and LU6.2 — but it still has to do a lot of software development before it can open the SNA portion of the network," Terrie said. "It's going to take a year before you see any significant software for an SNA Token-Ring."

On the positive side, Kutnick said the Token-Ring will be easy to implement. By the time it is ordered, delivered and installed, IBM will have likely announced more network products, such as a System/36 connection, the consultant predicted.

An unknown at this point is the fate of the IBM PC Network. This 2M bit/sec. broadband net is slightly less expensive than the Token-Ring and supports fewer devices, leading many analysts to predict that it will fade away.

"Once IBM sells its current PC Network inventory, I wouldn't be surprised to see the product dropped or

at least repositioned," said Kim Myhre, director of communications industry research at International Data Corp. in Framingham, Mass.

On the day of the IBM net announcement, many of the major networking companies unveiled Token-Ring-compatible networks, including Ungermann-Bass, Inc. and Proteon, Inc. (see story below). Other firms, such as 3Com Corp., said they will develop compatible products.

Major IBM information processing competitors, such as Digital Equipment Corp. and Wang Laboratories, Inc., said they will wait to gauge user demand before they will decide whether or not to build gateway products between their networks and IBM's new offering.

Independents climb on token-ring bandwagon

By Eric Bender

Independent local-area network vendors applauded the open-architecture approach of last week's token-ring network announcement by IBM and were quick to climb aboard the bandwagon. Many suppliers disclosed plans for compatible offerings in the first or second quarter of 1986.

"This really is a watershed announcement — as important an announcement as the IBM [Personal Computer] itself," maintained William Krause, president of 3Com Corp. in Mountain View, Calif. He called the token ring "the cornerstone of IBM's future computing architecture" and said the introduction "removes the last cloud of uncertainty" hovering over IBM's networking plans.

Last week's move also drove home the need for multiple-network environments, Krause commented. "Customers had received the impression that they were going to solve their

Continued on page 11

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NEWS

From page 10

Independents go to token rings

galactic networking problems with one global homogeneous corporate network," he said. "Now IBM has made it clear that there will be a lot of heterogeneous nets."

The Token-Ring will spark "a huge surge of interest" in networking, with third-party vendors helping to spread the standard, predicted Har-

ry Saal, founder of Nestar Systems, Inc., of Palo Alto, Calif. Unlike the case with other Big Blue nets, IBM will give third-party vendors "every possible piece of information" on the Token-Ring, Saal said.

"IBM contacted significant network vendors some time ago and advised them of what they were doing in the token-ring area and solicited interest," remarked Herb Martin, executive vice-presi-

dent at Corvus Systems, Inc. in San Jose, Calif. These vendors have been working on token-ring implementations for several months.

As did industry analysts, net suppliers commented on the current Token-Ring's missing pieces — particularly the lack of host attachments. They also took a few potshots at the IBM PC Network, suggesting that the availability of the Token-Ring will make the earlier network less attractive.

However, "the rumors of the death of the PC Network are vastly overstated," remarked Ken Biba, senior vice-president of Sytek, Inc. of Mountain View, which supplies PC Network cards to IBM.

Biba noted that IBM statements of ongoing commitment to the PC Network as a peer-to-peer work group net. He added that it can be expanded to support 1,000 units, as opposed to the 260-node limit of the Token-Ring.

Among the first independent net vendors announcing plans to support the Token-Ring were Bridge Communications, Inc. of Mountain View; Corvus; Nestar; Novell, Inc. of Orem, Utah; Proteon, Inc. of Natick, Mass.; 3Com; and Ungermann-Bass.

IBM ring net now runs only micros

By John Dix

NEW YORK — IBM's token-ring network unveiled last week supports only Personal Computers in its initial release and provides host links through gateways.

Unlike the previously available IBM PC Network, the new IBM Token-Ring Network is intended to be a general-purpose local network, fleshed out over time to support other IBM systems.

The IBM Token-Ring Network uses the IBM Cabling System wiring scheme. However, a twisted-pair wire option was announced to provide a less expensive cable alternative to the shielded wire previously offered.

Conforming to the IEEE 802.5 standard, the baseband Token-Ring is a 4M bit/sec. star-wired ring network that uses a token-passing access method. It supports up to 260 IBM Personal Computers, portables, XT's or AT's.

Hardware components of the IBM Token-Ring Network include a Network PC Adapter card and the Network Multistation Access Unit, an eight-port wire concentrator. The adapter cards are based on a token-handling chip set manufactured by IBM.

Personal Computers with adapter cards are linked to the Network Multistation Access Unit through the Cabling System. Although star-shaped, the network

provides a logical ring. The token — a special message that gives the possessor the right to begin communications — revolves around the ring from a node to the access unit back out to the next node.

Required software includes the latest level of DOS. Like the PC Network, the Token-Ring supports IBM's Network Basic Input/Output System (Netbios) high-level programming interface. Applications written to Netbios can operate on either the PC Network or on the Token-Ring.

New with the Token-Ring is Advanced Program-to-Program Communications for the Personal Computer. This provides a Systems Network Architecture (SNA) LU6.2, PU2.1 applications program interface to the network.

Announced with the Token-Ring were two new gateway programs and Token-Ring versions of previously available gateways.

The IBM Token-Ring Network/IBM PC Network Interconnect Program is a software product that enables the two nets to be coupled. The program runs on a Personal Computer, which is dedicated to the gateway task. The program carries a one-time charge of \$495.

IBM's Asynchronous Communications Server Program provides a gateway between the Token-Ring and/or PC Network and ASCII applications via switched, asynchronous communications links. The program runs on a Personal Computer and supports two simultaneous dial-up lines per server. The server can be used to establish outbound calls to ASCII applications or field incoming calls, IBM reported. The program has a one-time charge of \$495.

Capitalizing on gateway developments made available with the PC Network, IBM said the Series/1 PC Connect Program will be available for use with the Token-Ring in the second quarter of 1986. Another host link method is provided through the IBM PC Network SNA 3270 Emulation Program which has been tested on the IBM Token-Ring.

Prices for the Token-Ring Network, which is scheduled to be available in the first quarter of 1986, are \$695 for the PC Adapter card and \$660 for the Multistation Access Unit. With software an exemplary eight-station Token-Ring network would cost \$820 per station.

IBM stressed the open architecture of the Token-Ring. IBM Token-Ring-compatible adapter components are available from Texas Instruments, Inc. The TI TMS380 Token-Ring Local-Area Network adapter chip set is the result of a joint development program between TI and IBM, announced in 1982.

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NEWS

From page 1

Third-party service firms in parts blockade

peripherals. Service on IBM hardware will account for 76% of the \$170 million spent on third-party maintenance in the U.S. this year, according to Input, Inc., a Mountain View, Calif., market research firm.

IBM received generally high marks on cooperation levels from third-party service vendors contacted by *Computerworld*. "We have the same access to IBM parts as the IBM engineers do," said Brian Osborne, a marketing representative for Sentinel Computer Services, Inc. in Oak Brook, Ill. "We believe they think that we're good for them. We keep people with IBM by keeping their older IBM machines running. Then they'll go to IBM for new purchases, and that fits IBM's main goal — to sell."

In this sense the consent decree, ironically, may actually bolster IBM's dominance of the systems marketplace. With the proliferation of multivendor DP shops, users who wish to keep third-party service as an option could choose a hardware vendor that makes parts available to alternative service providers.

Without that option, "If your [hardware vendor] has maintenance problems, you're locked into them, and no one else will touch the machine," said John Barnhart, computer operations manager at Citytrust in Trumbull, Conn. "My whole thrust is availability, and I'm budget conscious. Third-party people offer good, competitive pricing. I would think [a vendor's refusal to cooperate with third parties] would be a drawback."

At the Anchor Savings Bank in Wayne, N.J., Vice-President Joel Talka insisted on the right to choose his own maintenance vendor in a recent contract for Docutel Corp. automated teller machines. TRW, Inc., Docutel's authorized service provider, "is good, but they're expensive," he said. "We just wanted to have that option, as we will with most of our

future equipment, depending on the situation."

But Talka said he ran into a brick wall when he attempted to contract service on Anchor's Diebold, Inc. ATMs to Technical Support Services, Inc., an Ossining, N.Y., third-party provider that services Anchor's IBM 3600 and 4700 series machines and terminals. "We'd like a third party on the Diebold machines, but they basically refuse to do it," Talka said. "On terminals, we'd love to have a single third-party vendor. Every time IBM raises the price [of service], you're saving more money."

Diebold may be changing its tune, however. Technical Support Services' first inquiry in January about servicing Diebold machines received a reply from Diebold that stated, "We are not interested in doing business with competitors to our service business." But now, 10 months later, Technical Support Services and Diebold are working on an agreement whereby Technical Support Services will service a Diebold customer. The key to the change, according to Technical Support Executive Vice-President Douglas Press, was the initiative of the customer.

"After several conversations, [a Diebold executive] said that if the Diebold customer sent a letter expressing its interest in [Technical Support service], they would cooperate," Press said. "It looks very promising right now. The key was the customer-generated letter. Customers [who want third-party service] have to get out there and exercise some freedom."

Technical Support Services President Tom McLaughlin said his customers have also expressed an interest in his company servicing NCR Corp. ATMs. But NCR responded in writing that it "did not have a pro-

gram in place to sell ATM or financial terminal support material to third parties." A second inquiry received the response, "A business venture between our organization and [Technical Support Services] would need to result in satisfactory benefits for both organizations."

NCR "flat out refused in any shape or form to even consider developing a relationship on parts," McLaughlin said. "I think it's a restraint of trade. The customer owns the machines."

"
Third-party people offer good, competitive pricing. I would think [a vendor's refusal to cooperate with third parties] would be a drawback.

— John Barnhart
Citytrust

could have one service vendor, that would be desirable," said Sam Triplett, vice-president of telecommunications for First Florida Bank in Tampa, Fla. "I wanted to obtain better service for the equipment — [about 200 NCR terminals] — and I've been very satisfied with [Technical Support Services] on our IBM terminals."

Chet Brown, manager of new ventures for the National Service Division of Xerox Corp. in Rochester, N.Y., said his company has had trouble getting parts from Wang Laboratories, Inc. and Hewlett-Packard Co.

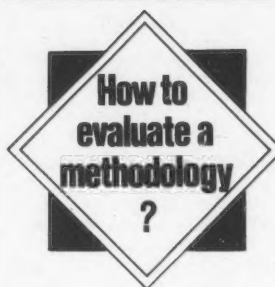
"Most contracts enable the customer to procure parts and maintenance; it's a matter of how far the customer wants to push that clause and push the manufacturer to do it their way," Brown said. In one instance, Xerox was seeking a large contract to service all the systems of a multinational manufacturing firm,

intending to consolidate its maintenance. Xerox offered to subcontract service of the HP systems back to HP's service division, but the mini-computer vendor declined.

"HP would unequivocally not cooperate in that regard," Brown said. "The customer could have leveraged his business [with HP] but chose not to push the conflict."

Mark Lee, manager of third-party programs and services for HP, said the Palo Alto, Calif., vendor provides service information only to its customers and authorized dealers. "We have a very good service organization that we feel is capable of servicing our installed base," he said. "Truthfully, there really doesn't seem to be that much of a market" for third-party maintenance of HP systems.

Cooperation levels can depend on



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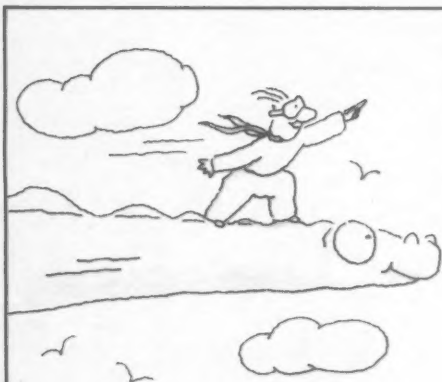
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NEWS

many factors, including the evolution of a company's markets.

Business attitude not adopted

"In contrast to [Digital Equipment Corp. and Data General Corp.], we never adopted a business attitude to sell boxes to system integrators," said Don Fitch, director of business management for Wang's Customer Services Operation.

"Wang has always sup-

ported its own installed base. We consider our documentation, training and diagnostics proprietary and not available." Spare parts are available to third-party service firms, according to Fitch, at full list price.

Xerox's Brown noted that there are usually third-party sources of vendors' parts at discount but often not in quantities needed by third-party service companies. If a vendor will not offer docu-

mentation or training to service a particular system, there are sometimes third-party training organizations that will. "In most cases, it's a matter of legwork — doing the work to get around the lack of cooperation," Brown said.

'It's reinventing the wheel'

At Precision Methods, Inc. in Lorton, Va., members of the engineering department will sometimes teach themselves how to service a component on which the vendor has refused to provide diagnostic information. "To a degree, it's reinventing the wheel," said Ogden Thompson, marketing manager of the 12-year-old disk and storage maintenance firm. "It's a trial and error and can be a long haul sometimes, but eventually we make it."

Like most third-party service firms contacted by CW, Thompson is resigned to the fact that hardware vendors will continue to vary widely in their levels of cooperation.

"I'm rather surprised when we don't run into it," he said. Cooperation "is like giving your competition a helping hand, so I can understand it. It's just part of the deal. You have to find a way to get the information that you need."

"If you don't have a sup-

ply source for parts or information, it is real difficult to do the job," said Bill Fedell, director of marketing communication for TRW's Customer Service Division, the largest third-party service provider in the U.S. "But it seems to us that when you put up that kind of barrier, there are inventive people capable of getting around it."

If the popularity of third-party service continues to grow, an increasing number of users may look at the availability of that maintenance option when choosing a hardware vendor.

"I would have to take that into consideration in my decision to buy," said Robert Smith, operations manager for the California Dental Service in Sacramento. Smith uses Sorbus, Inc. to service his IBM 3350 disk drives, 3420 tape drives and 3211 printers and IBM to service the organization's 3083, 4381 and 3725 processors.

"They've worked very well together," Smith said. "I came here from an ultraconservative, all-Big Blue insurance company, and I anticipated a potential problem but had none. This is the best of both worlds — good service and a lower premium."

CW News Director Peter Bartolik contributed to this story.

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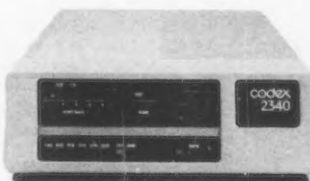
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NCR, AT&T profits, increase for quarter

Both AT&T and NCR Corp. last week reported increases in profits and revenue for the quarter just ended, but AT&T's results were below company expectations and slack demand forced a write-down of older products.

AT&T's earnings gain came despite a \$97 million writedown of the value of older inventoried consumer and business telephones. But a nonrecurring tax gain of \$30 million was also taken during the quarter.

AT&T posted a profit of \$378 million, or 33 cents per share, for the quarter, up from \$317 million, or 28 cents per share, in the same period last year, the first year when the telecommunications giant was hampered by post-divestiture growing pains.

AT&T's revenue advanced to \$8.93 billion from \$8.01 billion in the year-earlier quarter.

AT&T below long-range goals

AT&T Chairman Charles L. Brown said the results were below the company's long-range financial goals. According to Brown, the demand for AT&T's older products had slackened considerably, necessitating the

inventory writedown.

NCR Corp. last week reported that third-quarter revenue and profits were up 8% over figures from the year earlier period, with an increase in international operations more than offsetting a decline in domestic orders.

AT&T reported a 19% gain in profits on a 12% advance in revenue for the same period.

Dayton, Ohio-based NCR said revenue was a record high \$1.04 billion for the quarter, up from \$956.7 million a year earlier. Profits were \$71.7 million, or 72 cents per share, compared with \$66.3 million, or 65 cents per share, a year earlier.

The year-earlier figure does not reflect an extraordinary profit of \$30.6 million, or 30 cents per share, that resulted from a change in tax law applying to profits on overseas sales.

The company said international orders showed very substantial gains in U.S. dollars but that U.S. orders declined from the record level set last year, reflecting a general softness in the marketplace.

—Peter Bartolik
and Clinton Wilder

NEWS

CCA unwraps relational DBMS, productivity tools

Race for leadership in DBMS mart goes on

By John Gallant

CAMBRIDGE, Mass. — The struggle for supremacy within the independent data base management system market continued to heat up last week as Computer Corporation of America (CCA) unwrapped a new release of its Model 204 relational DBMS and an enhanced set of programmer productivity tools.

Just one month after rival Cincom Systems, Inc. released what it claimed is a completely new relational DBMS [CW Sept. 23], CCA made the

first of several moves in a planned series of product unveilings designed to bolster its position in the independent IBM mainframe DBMS market.

According to International Data Corp. (IDC), a Framingham, Mass.-based market research firm, CCA's Model 204 is the fifth most widely installed independent DBMS on mainframes. IDC said Model 204 was installed at approximately 275 sites as of year-end 1984. A CCA spokeswoman claimed the year-end figure was higher — 325 sites — and said Model 204 is currently running at 450 user sites. By comparison, Cullinet Software, Inc.'s IDMS/R — the most widely used independent DBMS — had more than 1,200 installations at

the year's end, according to IDC.

Many analysts lauded Model 204 as, technically, a superb product, which uses a so-called inverted file system architecture to support relational data management capabilities. But CCA was criticized for not offering a complete suite of productivity tools — an area of intense user concern — and for failing to promote the DBMS actively. Model 204 was developed in 1975 but was not made generally available until 1980.

Release 8.1 of Model 204 and Release 2 of CCA's Workshop/204 productivity tool package, combined with a new marketing strategy, are intended to make the company a stronger contender in the increasing-

ly competitive DBMS market, according to Adam Rin, vice-president of product planning and development for CCA. The company was acquired last year by Toronto-based Crown-tek, Inc., which made the company the base unit of its CCA Software Products Group. Since the beginning of 1985, Rin said, CCA's sales have increased by 60% over those of the previous year.

Rin said Release 8.1 of Model 204 enables users to access data stored in IBM VSAM files and to exploit the extended addressing space of IBM's MVS/XA.

In addition, Release 8.1 supports the enhanced release of CCA's User Language fourth-generation language, which is a component of the Workshop/204 package. User Language has been upgraded to allow for structured programming. He said Release 8.1 improves Model 204's performance, productivity and flexibility.

There were four major enhancements in Release 2 of Workshop/204, which includes User Language, a data base definition facility, an automatic screen and program generator, a screen painter, an editor, a query update facility for prototyping and a symbolic debugger.

Those enhancements included the following:

- User Language now offers block structures, enabling developers to write modular, structured programs. The fourth-generation language also provides access to VSAM and sequential data sets so applications can use data outside Model 204.

- Workshop/204 now supports automatic generation of screen and source code once a view has been defined to the data dictionary. Through this enhancement, Workshop/204 can be used to generate screen definitions and programs for the addition, deletion, updating and display of records.

- Workshop/204's file management facility now enables developers to define file and field entities to Dictionary, CCA's active data dictionary product, using a form interface. (This capability is supported by the newly upgraded Release 3 of Dictionary, which CCA also unveiled last week.) The file management facility optionally synchronizes Dictionary with the data base files in real time.

- A test facility has been added to Workshop/204 that enables applications to be run in test mode for symbolic, interactive debugging. The facility provides access to data and programs for interactive modification during the test.

In addition, Rin said, in November CCA will introduce an IBM Personal Computer version of Workshop/204 that will enable programmers to use the micro to develop, edit and perform syntax and error checking on mainframe programs that can then be uploaded to a host for testing and execution.

The product will enable users to download host programs for modification on the microcomputer.

Release 8.1 of Model 204 is being shipped now at a cost of between \$150,000 and \$200,000, depending on host operating system. Release 2 of Workshop/204 will be available in December priced between \$100,000 and \$125,000.

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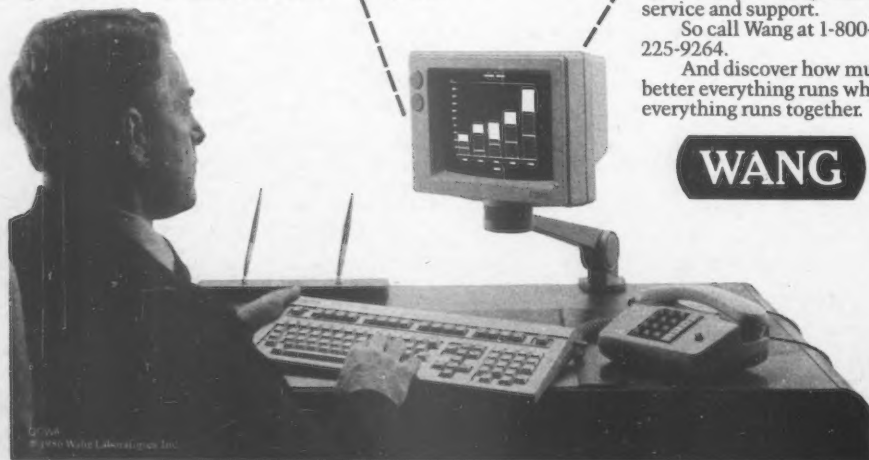
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NEWS

Prime adds power with replacements of 2550, 9650

By James Connolly

NATICK, Mass. — With claims that it is moving the power of its computer room systems into the office environment, Prime Computer, Inc. today is set to announce replacements for its 2550 and 9650 superminicomputers.

The announcement of the 2655, designed for use in an office environment, and the 9655, a computer room version of the 2655, is an apparent attempt to improve Prime's price:workstation ratio in the computer-aided design and manufacturing (CAD/CAM) market and to aid the latest Prime drive into the office automation market.

Compared with their predecessors, the 2655 and 9655 are said to offer 10% to 50% improvements in performance while costing the same as and occupying the same two 30-by-21-by-31-in. cabinets as the older machines did. Company officials said the performance was accomplished with high-speed logic elements and a two-stage pipeline design.

A spokesman estimated the processor speed for the new systems was 1.3 million instructions per second (MIPS) for each, compared with 0.85 MIPS for their predecessors. The systems, which fit into the middle range of Prime's product line, also are said to have 50% faster CPU speeds in engineering applications and to provide 10% to 20% performance gains as full systems in engineering and commercial data processing markets. The systems, with up to 4M bytes of random-access memory (RAM), also allow for twice the main memory of their predecessors, using 256K-byte RAM chips instead of 64K-byte chips.

Prime also said that while the older systems supported four CAD/CAM users, the new systems will support

six users; and while the 2550 and 9650 supported about 30 general-purpose computer users, the new systems handle 64 users. The 2655 and 9655 match the speed of Digital Equipment Corp.'s VAX-11/780, while exceeding the multiuser performance of DEC's office environment Microvax II, Prime said.

Slow in introducing OA software?

One superminicomputer market analyst observed that Prime has been slow in introducing OA software in a tight office market. A company spokesman noted the announcement was made only two weeks after Prime introduced its Information Connection integrated word processing, spreadsheet and business graphics package. However, software to upgrade Prime terminals to IBM Personal Computer XT-compatible micros and software to support personal computer-to-host file transfers are still in the test stage.

An existing 2550 or 9650 can be upgraded to a 2655 or 9655, respectively, through a board swap for \$22,000, Prime said. The I/O controllers, peripherals and software in the 2550 are compatible with the 2655.

Available now, a typical 2655 configuration includes a processor with 4M bytes of main memory, a 315M-byte Winchester disk, a streaming tape drive, a console and Prime's Primos operating system. That configuration costs \$99,200. A spokesman said two additional 315M-byte drives can be added in a third cabinet without increasing the office noise level.

In another announcement scheduled for today, Prime is expected to announce an agreement for 3M Corp. to package the 2655 with 3M software and peripherals as a document retrieval system.

MSA may lose \$3.5 million

Quarterly loss lower than anticipated

By James A. Martin

ATLANTA — Management Science America, Inc. (MSA) said last week it expects a third-quarter net loss of \$3.5 million, or 20 cents per share, compared with the \$10 million to \$12 million loss the company had earlier projected.

Losses were less than previously announced as a result of additional contracts closed during the reporting period's final days and lower expenses than expected, the company said.

Operating revenue for the period ended Sept. 30 was \$30.9 million, up 8% from \$28.5 million for the 1984 third quarter.

Expenses were \$38.5 million, up from \$34.5 million in the 1985 second quarter as a result of increased advertising and marketing efforts in anticipation of the normally strong fourth quarter.

The company had an overall loss for the third quarter of a year ago of

\$1.8 million as a result of \$713,000 in income from continuing operations and \$2.5 million in losses from discontinued operations.

Although fiscal year 1985 earnings are expected to be significantly less than the 77 cents per share that MSA earned from continuing operations the year before, the company said it expects to post an overall profit for the year.

Slowdown in customer spending

Earnings have declined below forecasts owing to a slowdown in customer spending in a weakening economy, the company said.

MSA's third-quarter losses were indicative of an industry slump that "will take some time [for MSA] to work out of," according to Kenneth Burke, an analyst with Alex Brown and Sons Research, a Baltimore investment firm.

He added that he would be very surprised if MSA did not show a profit for 1985 at year's end but added that earnings per share could be as low as 40 to 50 cents.

MSA's cash and investments in the third quarter were \$92.5 million.



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VIEWPOINT

EDITORIAL

The token passes, reactions begin

The two loudest reactions to IBM's announcement of a token-ring network last week were that it was 1) too little and 2) too late. Given that IBM is no doubt preoccupied with whatever next week's announcement will be, we will volunteer to rebut these reactions.

Too little? Only because the token-ring architecture introduced last week is so limited in today's terms, in the context of long pent-up industry and user hopes, and because the token ring does little more than its PC Network brother. Forget this, and look at the promise. Given its track record with products such as Systems Network Architecture (originally its single network architecture), IBM can be expected to flesh out the token-ring architecture and, over time, produce what will likely become the best and most widely used computer network.

Too late? Yes, for some users who can no longer wait until next year's projected delivery date for the token-ring product. But not late from IBM's perspective — and this is IBM's ball game, after all. Nor was it late for the third-party network vendors who last week began jumping on the token-ring bandwagon en masse. Confidentially, we expect to see IBM's holdout competitors scurrying for that very bandwagon in the near future.

Trade, politics and a dose of reality

One sure way to tell when politicians are running for cover is to note the degree to which references to "philosophical views" and "profound beliefs" increase in news reports. You can see it happening now, with communiques from Capitol Hill reporting on erstwhile free traders seeking the snug haven of protectionism. All because of a profound shift in political philosophy, of course.

The current trade debate has no more to do with philosophy than does deciding where to go to lunch. It is a matter of economic reality that translates quickly into political reality.

Far be it from us to delve into the complexities of international trade and propose the perfect solution to the U.S.-Japan electronic trade imbroglio. What we do know is that there is one criterion by which we must judge any proposed U.S. trade restrictions: That is, will they work? Will they help beleaguered U.S. industries compete as well as establish the groundwork for long-term stability in the marketplace?

Both means and ends must be clear in the minds of those who now propose solutions. Is our goal to stem the flood of Japanese-made computers into the U.S.? If so, fine, but what will that policy do to the economic health of such companies as Amdahl Corp. whose IBM plug-compatible mainframes carry a made-in-Japan tag everywhere but on the label?

And are U.S. companies that seek Japanese partners prepared to deal with opposition from political and industrial forces in Japan, opposition IBM now faces following its alliance with Nippon Telegraph and Telephone Corp.?

These are not matters of philosophy, and our political representatives should not pretend otherwise. International trade is shrinking the world and expanding the village. That is the reality with which we must deal.



LETTERS TO THE EDITOR

New use of old science fiction term leads to confusion about robotics

It was pleasing to see the Update, "A look at robotics in the U.S." [CW, Oct. 7], lead with a quote from one of Isaac Asimov's classic science fiction works. As the present resembles science fiction more and more, from space shuttle flights to laptop computers, the mainstay of my youth suddenly has gained an aura of respectability.

However, I do wish to dispute the statement in the article: "Science fiction has, in fact, cast the field of robotics into confusion and misunderstanding..." First of all, let's clarify which was here first.

Until recently, the field of robotics existed nowhere except in science fiction. This turf has been definitively staked out for 50 to 100 years. Research, design and manufacturing of robotics products is not nearly as old.

More to the point, however, is the shifting meaning of the word "robot." Robotics is related to the Czech word for "worker."

Robots in science fiction have tended to be thinking machines that usually, but not always, looked like people. As a general rule, be it box shaped or human shaped, the key factor was some degree of free will, conscious thought, emotion, soul or some other human attribute.

The bulk of the robots described in the article are nothing of this sort; they are freestanding, specialized devices that manipulate parts and tools and are increasingly being coupled with artificial intelligence-based systems for perception and thinking — but Robby the Robot, much less C3PO or R2D2, they ain't.

It isn't science fiction at fault here. It is the new use of a term that has had an established definition elsewhere.

— Daniel P. Dern
Cambridge, Mass.

DATA PAST

Ten years ago

BOSTON — A report published by the U.S. Department of Labor predicted that the number of jobs for clerks and unskilled workers would decline faster in New England than in the rest of the U.S. by 1980 because of increasing automation in the area. The report, however, forecast a healthy growth in opportunities for computer programmers, analysts, operators and other DP specialists because of the heavy concentration of high-tech industry in that part of the nation.

CAMBRIDGE, Mass. — The membership of the Association for Computing Machinery topped 30,000, making it one of the world's largest information processing organizations. This was in contrast to 1974, when membership figures were holding steady at 28,000 in the face of a 20% growth rate in the industry.

The increased numbers were attributed to the professional group's budget surplus and its more efficient handling of questions, problems and complaints.

MINNEAPOLIS — Xerox Corp. and Honeywell, Inc. signed a letter of agreement to allow Honeywell field specialists to service Xerox computers.

The proposal outlined that Honeywell would handle all contracts with Xerox customers and would provide marketing, sales and maintenance support to Xerox users. Xerox software and hardware engineering was scheduled to continue through 1976, according to the agreement, and after 1976, Honeywell would take over that activity.

WASHINGTON, D.C. — President Gerald Ford nominated a chairman and members to the National Commission on Electronic Funds Transfer, a study group he signed into existence in 1974. According to White House sources, the commission was formed to study and recommend administrative action to develop public and private electronic funds transfer systems.

TULSA, Okla. — Just 72 hours before the U.S. Supreme Court was to decide whether to hear the case, Telex Computer Products, Inc. negotiated a settlement of its antitrust suit against IBM. The settlement released Telex from an obligation to pay IBM \$18.5 million as a result of IBM's counter-suit on trade secret charges. The pact also barred Telex from bringing those charges against IBM in the future.

VIEWPOINT

DBMS success relies on management methods



THE DATA CENTER

John P. Murray

Movement to a data base management system environment requires a change in the manner in which the systems and programming staff does its work if the potential of the DBMS is to be realized.

One of the benefits of the DBMS is the ability to build an environment where answers to business questions can be obtained rapidly and easily. There is no question about the ability, through the use of a good DBMS and fourth-generation programming language, to produce those results. However, in many installations the disparity between that which can be accomplished and that which is actually accomplished is often great. This disparity is both unfortunate and avoidable.

Part of the problem has to do with the continued imposition of third-generation system design and programming techniques in a fourth-generation environment. This goes beyond technique to ways of thinking. What sometimes occurs is a reluctance on the part of those within the systems and programming section to accept a changed environment and to adjust their methods and approaches to make effective use of the DBMS and the fourth-generation programming language.

Murray is director of management and information services for American Breeders Service, a DeForest, Wis., division of W. R. Grace & Co., and is the author of Management Information Systems as a Corporate Resource.

That reluctance is understandable. Many of those in the systems and programming section have been completely in charge of the design and programming aspects of the system work for a considerable period of time. The requirement to change, to relinquish a portion of that control, cannot be expected to come easily.

The result is the continued development of systems in the old, third-generation manner. At best, the benefits of the fourth-generation processes will never be fully realized. At worst, a currently undesirable situation will only continue to deteriorate, in spite of the availability of new tools and techniques. Eventually, hostility will develop between members of the systems group and those of the data base group.

This will present the management of the information processing department with a predicament, and if progress is to be made, management must provide support to the DBMS group.

If the new techniques available through the DBMS are not supported and used, the same inadequate approaches to system design and programming will continue. In fact, things will become worse because the installed DBMS and fourth-generation programming languages will simply become a facade. Better to continue as before than to proceed incorrectly.

Before there were good DBMS packages, the available technology constrained design and programming options. The development of the DBMS environment changed that situation. Failure to deliver information with more speed, flexibility and ease is not the failure of the DBMS but of those who cling to old-fashioned, incorrect techniques.

Many reasons will be cited for resisting the use of a DBMS: for example, not wanting to create new data elements or being forced to use existing files

because they better fit the needs of the clients. The alternative offered will be some separate system that will end up as an appendage of some existing system or systems rather than as a part of an integrated DBMS.

In addition, the fourth-generation programming language will often be used the same as Cobol has been used in the past. Because insufficient thought and experimentation will be given to the appropriate ways in which to use this tool, the results in many instances will not be satisfactory.

In some environments, these poor results will then be used to prove that the fourth-generation programming languages are not as good as Cobol. What this actually proves is that those who have used this tool have not used it correctly.

The introduction of a DBMS and a plan to make effective use of its features often sets the stage for political hostility within the information processing department. Members of systems and programming will sense a diminution of their power and authority, in favor of the DBMS group, and to a certain degree they will be correct. But, if the DBMS effort is to be successful and if the goal of improved delivery of information is to be achieved, the DBMS group must possess sufficient authority to produce the desired results.

The MIS profession should be past arguments about the value to be found in the installation of a good DBMS and fourth-generation programming language. There is more than ample evidence to support the value of such products. The issue should now be to adopt the appropriate management techniques to ensure success. The ultimate degree of success is contingent upon the willingness of the management group to encourage members of systems and programming to change their ways of thinking.

Getting down to the business of software



READER'S PLATFORM

David A. Feinberg

Imagine returning to work after lunch and having your manager shepherd you into the office before you can even take off your coat. Turns out there is a critical problem with some of the department's software. Failure to correct it will prevent the company from meeting a major, top-level milestone. Your manager says the importance of the problem calls for the best available people.

Flattered, you agree to fix the problem only to discover that it will take about a week to do the work. When you report this back to the boss, you are told the application has to be working by the next morning, or the company will lose millions of dollars.

After 42 consecutive hours, 61 cups of coffee, 18 candy bars and three packages of gum, the problem is fixed, and your two top people stagger toward home with everyone's thanks ringing in their ears. After a respite of a day or so to catch up on sleep, they return to work only to discover once again that you have

been gathered into your manager's office...

Software engineers and managers are celebrated for being able to make any program work. It doesn't matter whether the software is an accounting package or an operating system. If it doesn't function as documented, software personnel will empirically determine the correct performance.

An intriguing proposition arises from this situation: what would happen if data processing personnel just quit jury-rigging the programs? Would the computing world as we know it come to an end?

The problem, as all who have worked their way around malfunctioning software know, is to establish the proper foundation for operating in a more appropriately disciplined manner. Based on a recently completed experiment, at least one technique for constructing such a foundation is now available.

The experiment was conducted during the procurement of a special-purpose compiler required to generate highly optimized executable code for an embedded real-time computer. To ensure that the compiler met all of its critical requirements, two actions were taken beyond those normally used for third-party software acquisition.

First, the detailed specifications for the compiler, including the initial users' manual, were written into the procurement contract document. Additionally, all specifications for the

embedded computer as well as all descriptions of interfaces among the computer, its peripherals and the compiler were also included in detail. It made for a whale of a contract, but as a result, all of the requisite technical information was there in one place along with the other usual contractual materials.

Second, a new Term and Condition clause was included in the standard contract. It simply stated, "In cases of any discrepancy or conflict between the operation and/or performance of items provided as part of this contract and the technical documentation contained herein, the documentation shall have precedence."

Satisfying results

The results were most satisfying. The compiler, after the usual early debugging phases, turned out to be a masterpiece. It met or exceeded all of the requirements placed on it. Moreover, it performed as the documentation specified.

As is typical with third-party software acquisitions, a number of technical issues arose during the course of development and checkout. As a result of the expanded contract contents and provision, typical negotiating dialogue tended to sound something like the following:

Buyer: "Since work started, we've found a more efficient interface for the compiler's subroutine calls to the operating system I/O service. We've already implemented the operating

system changes, and we want you to make the compiler conform."

Seller: "Yes, it is more efficient, but for us to use it means that we have to change the compiler and, consequently, the interface specification in the contract. That will require a formal contract change. As long as we've got to open up the contract for the technical part, we should probably also adjust delivery dates and cost increases as well. OK with you?"

Buyer: "Uh, no. We need to stay with the original schedule and budget. Go ahead and use the old interface for now, and we'll talk about switching to the new one in any potential contracts."

Of course, the buyer could have elected to accept new dates and costs, and then the new interface would have been implemented.

The dialog also illustrates another underlying power of this new technique: no longer do software engineers and managers have to live with excuses that a program or package is right but the documentation just needs a little cleaning up.

The contract now explicitly defines what should and should not be occurring. Changes are always possible but only by renegotiating appropriate portions of the procurement agreement. This, in turn, keeps everybody — buyers and sellers — on their best behavior and helps forestall major discrepancies, problems and misunderstandings. That's what getting down to business is all about.

Feinberg is an MIS manager specializing in software troubleshooting at Boeing Co. in Seattle.

NEWS



WORLD DIGEST
CW International
News Network



TOKYO — In the latest wave of international opposition to apartheid, the Japanese government has adopted trade restrictions against South Africa. The restrictions were announced by Foreign Minister Shintaro Abe which, who said, "All countries should share the burden of tackling and solving this issue [apartheid]."

The restrictions include a ban on all exports of Japanese computer products to the South African army and police. Foreign ministry officials said only South African organizations and groups "directly involved" in the racial discrimination policy will be subject to the export ban.



TOKYO — Nippon Telegraph and Telephone Corp. announced today development of what it claims is the world's

first loop architecture for "compound computing." Nippon said the optical-fiber-based architecture enables data exchanges and simultaneous processing between the host computer and up to 127 mainframes, terminals and communications control units.

Nippon said significant improvements have been scored in the reliability of the whole system, which includes a backup mechanism to overcome breakdown of any component.

STOCKHOLM — Ericsson Information Systems, Inc., the data processing and office automation division of the Swedish telecommunications and electronics group, plans to resume production of the company's personal computer at the turn of the year.

Ericsson spokesman Gunnar Blacklund said the resumption of production would be preceded by an intensive European marketing effort, with expenses for advertising amounting to a "a few million" in kronor, the Swedish currency.



LONDON — British microprocessor maker Immos announced last week its Transputer, a 32-bit chip designed for parallel processing.

After a \$25 million (U.S.) investment and seven years of research, the Thorn-EMI Co. subsidiary said it is banking on the chip to take it into world markets and back to profitability.

Iann Barron, head of the Immos design team, heralded the transputer as Europe's answer to the threat posed by Japan's fifth-generation project. A system with 300 of the \$500 Transputers would have a performance level equivalent to the world's fastest Cray Research, Inc. computer, Barron claimed.



LONDON — Following similar moves in the U.S., IBM is targeting a major reorganization of its UK sales staff for Jan. 1, according to a source inside the company. The source, who requested anonymity, said plans call for merging of IBM's two major marketing divisions, Information Systems Accounts

Marketing and Information Systems Marketing.

The move is part of IBM's new strategy to use its salesmen only for top accounts, while smaller customers are serviced more and more by third parties, which may mean a surplus of salesmen. But IBM has always denied that any selling jobs will disappear and is instead claiming that the company is recruiting staff.



STOCKHOLM — While the American computer market continues to face hard times, there are still no signs of similar decline in West Germany or Sweden, whose markets have posted increases in revenue, spending and exports. During the first half of 1985, West German computer makers registered a 15.6% increase in product revenue, well above the average for other West German industries.

In Sweden, spending on computer equipment remains strong. According to Swedish government figures, Swedish computer exports increased by 33% in the first half of 1985 compared with the same period in 1984. The total value of exports rose to about \$400 million, the report said.



CANBERRA, Australia — The Australian federal government's Department of Veteran's Affairs has been accused of wasting \$6 million per year because of overloaded computer facilities, a figure said to be increasing at a rate of \$200,000 per month.

A report prepared by computing consultants Ferris Norton Associates in association with Stanford Research Institute of California and Touche Ross & Co., an accounting firm, claimed that the department's Amdahl Corp. 5860 mainframe, which drives some 1100 terminals, was not operating at its expected level of capacity and that site facilities were deteriorating.

The department plans to spend \$15 million more than the \$45 million allocated for the next five years to add to its computing power and to stop waste.



CANBERRA, Australia — Australia's biggest dealer in Texas Instruments, Inc. products has alleged that the Australian Defense Department altered the bidding document for an order of 37 personal computers to read "IBM Personal Computer XT only."

The alteration, according to the dealer, is a restriction of trade and comes in spite of the fact that TI personal computers were approved by the public service unions as being acceptable, and IBM machines were not.

The alteration appears to be in line with an Office of Defense Production policy that requires IBM compatibility, a policy some claim is restricting trade.



TOKYO — As part of its participation in the Japanese government's "Buy foreign" campaign, Mitsubishi Electric Corp. said Thursday that it will purchase \$340 million worth of foreign products, mostly office automation equipment and semiconductors, from now until the end of March.

Mitsubishi's projected foreign procurement this year, \$308 million of which will be from the U.S., represents a 20.3% increase from the year-before level.

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Crystal Ball Profile
of Dataquest

AT&T reaches out

Tools permit limited file exchange
between 3B line and IBM mainframes

By Paul Kozminski
LINCOLN, N.J. — AT&T last week announced its first set of tools that enables an AT&T 3B computer to communicate with an IBM mainframe. Included in a deluge of AT&T product announcements were two models of the 3B, four communications products for the 3B line and a version of AT&T's Unix System V Release 2 that runs

IBM gives up SBS for 16% of MCI

By Bryan Wilkins
WASHINGTON, D.C. — IBM last week initiated a major push into telecommunications by selling its 50% ownership interest in Satellite Business Systems to MCI Communications Corp. in return for an immediate 16% stake in MCI, the second largest long-distance carrier. The agreement permits IBM to acquire up to 30% of MCI during the next three years, and IBM indicated it will in-

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standards/83
erament are typically motivated by per-
sonal financial crises or job dissatisfac-
tion Page 2.

■
Following the murder of two Wang
employees in El Salvador, some compa-
nies are reassessing aspects of interna-
tional business travel Page 4.

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By Jeffrey Sauer
SUNNYVALE, Calif. — Amdahl Corp.
last week extended its supercomputer
line both upward and downward by an-
nouncing two additional vector process-
ors, one with performance exceeding
one billion floating-point operations per
second.

With the introduction of Models 1400
and 1400A, Amdahl's family of IBM-com-
patible machines built by

and roughly 40% the performance of
Cray Research, Inc.'s X-MP-1.
The top-of-the-line 1400, meanwhile,
reportedly executes 1.14 Gflops, com-
pared with 532 Mflops for the 9-month-
old 1200, and outperforms
X-MP-1 by approximately 400%.

Each of the four Amdahl machines
runs the same software and can be
graded in the field to its next larger si-
ze, according to the company.

Although the four machines have
nearly identical machine cycle times

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 31. Systems Manager/Systems Analyst
 32. Manager/Supervisor Programming
 33. Programmer/Methods Analyst
 35. QA/VP Director/Manager/Supervisor
 41. Data Comm. Network/Systems Mgmt
 42. Engineer/Scientific R&D/Technical Mgmt.
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- C. Microcomputers/Desktops
- D. Communications Systems
- E. Office Automation Systems

COMMUNICATIONS



DATA STREAM
Paul Korzeniowski
CW Senior Writer

Voice mail suits linger

By Paul Korzeniowski

Robin Elkins was not your average 17-year-old male. Most adolescent men spend their time rooting for the local sports team and testing the patience of their parents — or sometimes the law. Elkins passed his time inventing a technique to digitize audio recordings, a capability with applications in the computer and music industries.

"I was an audiophile and channeled my energies into studying the electronics industry," according to Elkins. This adolescent inclination eventually would lead Elkins into court where he would challenge industry giants, such as IBM, Wang Laboratories, Inc. and Digital Equipment Corp., charging that the voice mail systems of these and other companies borrowed from his invention.

Elkins invented that audio digitization technique in 1972. Uncertain of what to do with it, he heeded the advice of his father and filed for a patent. His initial attempt in 1975 was an eye-opener. A patent brokerage house took his money but never made the filing. "I began to suspect that something wasn't right when the company wouldn't allow me to talk to the attorney who was supposed to be filing the patent," Elkins stated. So he turned to another attorney, who filed the patent in 1976.

In November 1978, the patent was approved. One year later, the inventor discovered what he believed was the first infringement on his patent in a product from Sony Corp. He wrote the company a letter that threatened Sony with legal action if it did not alter its

Continued on page 26

Proteon unshaken by IBM

Confident chairman: Token rings 'old as the hills'

By John Dix

NATICK, Mass. — If IBM's release of its token-passing local network gives Howard C. Salwen the heebie-jeebies, he doesn't show it.

Salwen, chairman of the board of Proteon, Inc., believes that sales of his company's existing, functionally straightforward token-passing ring networks will continue to thrive regardless of IBM's announcement. Proteon will, however, offer an IBM-compatible network now that the IBM has released its specifications.

The IBM look-alike will round out Proteon's product line that today includes two models of the company's Pronet — the 10M bit/sec. and the 80M bit/sec. renditions. Proteon has installed more than 150 Pronet-10s, the lower speed net, according to Kim Myhre, director of communications industry research at International Data Corp. in Framingham, Mass. The 80M bit/sec. net was introduced more recently.

Pronet initially was developed while Salwen and some of his consulting col-

leagues were working on a joint development project with MIT in Cambridge, Mass. The university's campuswide network is based on the results of that effort. MIT receives royalties for its contributions to Pronet's development.

Contrary to popular belief, the basic concept of token-passing ring networks used by Proteon and proposed by IBM is not new. "Token rings are as old as the hills," Salwen said. "The first ones were built as long ago as 1960." Even the idea of counter rotating rings — which provide alternate signal paths in the event of a link failure — dates back 25 years, Salwen claimed.

Ring architectures are well understood and simple, Salwen said. Simplicity is a Pronet selling point. The ring topology enables Proteon to deal exclusively with one-way or simplex signals. Removing the electronics necessary to pump data in two directions over the same wire reduces network complexity and cost. These simplex signals can be modulated easily onto any

Continued on page 26



Salwen, chairman of Proteon, Inc.

Multidrop net manager out

The latest entrant in the network management arena is Teleprocessing Products, Inc. based in Simi Valley, Calif. The company has announced its Multidrop Network Management system, which consists of a digital termination unit, a central diagnostic facility based on an IBM Personal Computer XT and a line multiplexer.

The package works with modems equipped with the company's digital termination equipment, TP-502 channel service unit/data service unit. Modems can transmit data at speeds from 2,400 to 9.6K bit/sec. on networks supporting IBM's Systems Network Architecture or Synchronous Data Link Control protocols, Telepro-

cessing Products said.

Multidrop Network Management supplies 14 types of testing functions including lockout, remove loop-backs, data terminal equipment loop-back, lockout test, front-panel status, alarm status and alarm acknowledgment.

The system supplies a number of reports including maximum and minimum response times, traffic status and number of retransmissions. Trouble tickets are stored in the package's data base.

The digital termination unit sells for \$1,795; diagnostic software is available for \$2,500, and the 3502 multiplexer costs \$740.

INSIDE

DG announced a voice mail option for its Comprehensive Electronic Office software, and introduced an integrated voice/data terminal /23

NEW THIS WEEK

- DG introduces a family of modems
- AT&T enhances the Merlin Communications System

■ For more on these and other new products, see pp. 65-78.

INSTANT ANALYSIS

"Token rings [like IBM's] are as old as the hills. The first ones were built as long ago as 1960. Even the idea of counter-rotating rings dates back 25 years."

— Howard C. Salwen
Proteon, Inc.

Security Dynamics releases two-part security system

Spurs battle to keep hackers from data

By Paul Korzeniowski

BOSTON — Techniques to prevent hackers from accessing corporate mainframes often prove to be as ineffective as attempts to stop Rambo from completing his latest mission.

Security Dynamics, a small start-up firm, has cleverly mixed existing technologies in a relatively inexpensive product that may help keep hackers at bay. The product, Access Control Encryption (ACE), consists of two pieces: host hardware or software and credit card-size cards given to each authorized user.

At 60-sec. intervals, each card, equipped with a 4-bit microprocessor, generates a random number

shown on an LCD. Whenever a user attempts to log on to a computer, he enters a personal identification number (PIN) and the random number displayed on his card at that moment. The PIN number corresponds to the time and date that Security Dynamics produces the card. The random number, which changes every minute, is generated using an ACE algorithm and PIN.

When a user enters his PIN, the host ACE systems will also generate a random number using the same algorithm. If the user and host numbers match, the user gains access to the system.

The product was introduced with relatively little fanfare at a computer security show in November 1984. At that time, ACE was more an idea of Kenneth Weiss, president of the company, than a tangible product. Weiss

has spent the last year filing patents incorporated into the product, building an ACE prototype, hiring a staff, finding beta sites, lining up suppliers of ACE materials and finding hackers to test the system. The work, which has been completed from his three-floor Boston condominium, drained the entrepreneur's bank account of \$700,000.

Weiss claimed, in a *Computerworld* interview, that his efforts have not been in vain. He has filed patent applications for the system's design and techniques used to keep the host clocks and card clocks in sync. A staff of approximately 10 people has taken over the lower floor of his condominium designing and debugging ACE software.

Beta versions of the product have been shipped to four sites. Weiss has signed contracts with companies lo-

cated in the Far East to supply the components needed for each card. A venture capital firm is pumping \$3 million into Security Dynamics. Approximately half a dozen companies have placed orders for the device. The U.S. Department of Defense awarded a contract worth close to \$750,000 to ACE, providing the system can be delivered next year.

Despite the achievements, the company still has to overcome some obstacles before ACE mirrors Weiss' claims. The beta sites are working with cards approximately 10 times larger than a credit card. Security Dynamics' president claims that the components needed to reduce the card's size are currently used in some of today's ultrathin calculators, and his offshore suppliers will ship the necessary components in January

Continued on page 23

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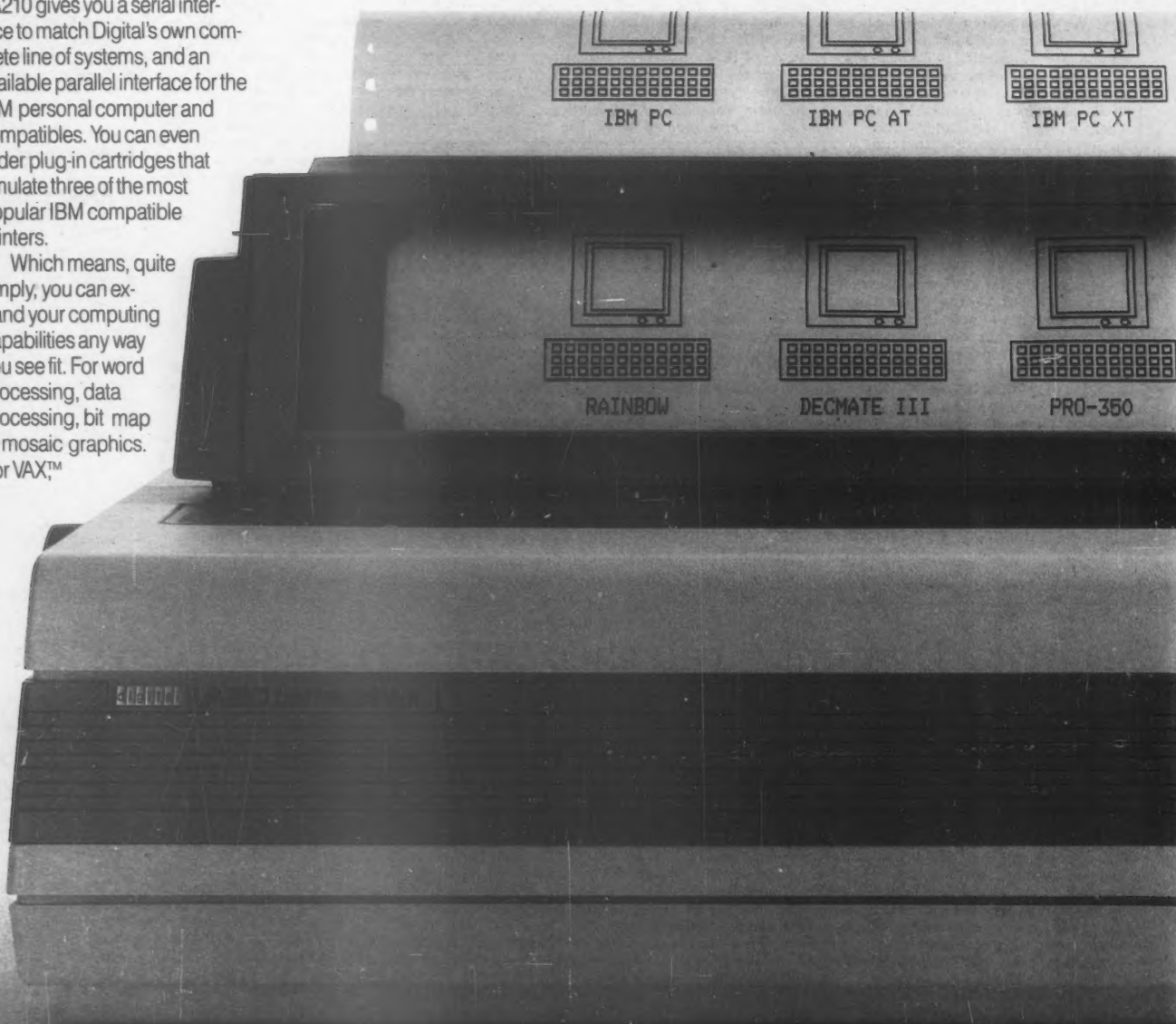
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plus Digital's VT100™ line drawing set. And it gives you a choice of more than 35 optional faces and fonts – Courier, Orator, Gothic, APL, and italics as well as special custom fonts – through plug-in cartridges that let you vary your type face even more. Finally, the LA210 lets you print bold or condensed and change faces or fonts on a dynamic character-by-character basis. So your output is truly customized to suit just about any presentation you have in mind.

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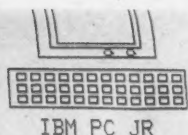
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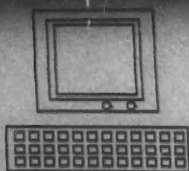
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COMMUNICATIONS

DG launches CEO mail option, voice/data terminal

By Donna Raimondi

NEW YORK — Data General Corp. of Westboro, Mass., announced a voice mail option for its Comprehensive Electronic Office (CEO) software at Info '85 last week. At the same time, the company released an integrated voice/data terminal.

Voice mail will be an optional feature to the electronic mail portion of CEO. Unlike the voice mail systems from the manufacturers of private branch exchanges, DG's system will be incorporated into its minicomputers, storing digitized voice on an associated disk.

The option requires the installation of a 15-in. Voice Mail Controller (VMC/2), a \$10,000 communications

board compatible with any of DG's Eclipse MV family of minicomputers that provides the telephone-to-processor interface. The controller has two telephone ports and looks to the attached PBX like a standard analog telephone set.

CEO users can access the system from any standard tone-dialing phone, using the telephone keypad to enter voice mail commands such as a request to replay messages. A revised version of the CEO software is necessary, but there is no charge for that, the vendor said.

The controller provides a speech store-and-forward capability accessible to authorized users from any tone-dialing telephone. The option

enables voice messages to be received, filed, forwarded and deleted. It also makes it possible to distribute messages to mailing lists. Messages can be flagged as urgent, confidential or certified. Voice comments can be attached to files, messages and documents being mailed or forwarded.

Processors can be configured with up to three VMC/2 boards for local voice mail support, or a single processor can contain up to eight VMC/2 boards and can be used as a voice mail server for a network of Eclipse MV family systems.

Also released was the Dasher D555 integrated voice/data workstation, said to combine telephone and workstation functions. The ANSI-

standard text and graphics terminal supports DG's voice/data products, including the VMC/2 controller.

The attached telephone is a two-wire AT&T Bell Laboratories 2500-compatible analog tone-dialing unit that supports call forwarding, call waiting, conference calling and quick calling. The workstation contains an internal phone list of up to 40 entries and is capable of dialing more than 250 digits with one command.

The D555 costs \$1,595 and is not a requirement for the newly announced voice/data system, the vendor said. The workstation features a 9-in. monochrome screen and a tuck-away ASCII keyboard with full-size keys.

From page 19

Security Dynamics releases system

1986. Two months will be required for Security Dynamics to program the cards, and first shipments are scheduled for March.

Weiss stated that ACE can support half a million users. Beta sites are working with only 10 to 30 cards so no one can be certain that the software is robust enough to support a large number of users.

Another claim is that the product can be integrated into virtually any operating environment that uses traditional enter and exit commands. But two DP professionals at large corporations that have seen ACE demonstrated were not convinced that the product could be as easily tailored to an operating environment as Weiss stated.

Weiss said that beta users are using ACE in IBM MVS and CICS operating environments.

If Security Dynamics succeeds in shipping its product next year, ACE may establish a new standard for security packages, offering a number of advantages over existing packages. The tool is easy to use, can be carried by remote workers, and the five-to-eight-digit password is, according to Weiss, virtually impenetrable.

Also, ACE is relatively inexpensive. There are two ways to implement it — with a black box that stands between the host and the incoming lines or as host software. Prices for the box range from \$5,000 to \$25,000; host software costs \$50,000. Cards come with one-, two- or three-year batteries and range in price from \$34 to \$58.

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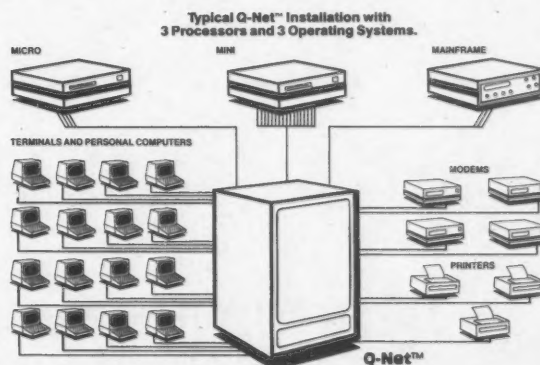
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COMMUNICATIONS

From page 19

Voice mail suits linger

product or pay him royalties. Sony ignored the letter.

A number of other companies developed products that Elkins believed infringed on his patent. He had discussed his invention with leading figures in the digitized voice industry, and they spread word to these companies. The firms claimed that they developed their products independent of his invention.

For six years, Elkins waged a lonely battle, firing off letters to more than 40 firms he thought were robbing him of just compensation.

"I couldn't afford an attorney," he stated. "The firms I talked with wanted at least \$10,000 before they would take my case. They were leery of taking a case against such large companies. I couldn't find anyone who would work on a consignment basis." Another problem involved the technical issues in the case, something that a judge or a jury might not understand.

Finally, the Fort Lauderdale, Fla., firm of Feldman and Levy, PA answered Elkins' call. In June, the firm filed a patent infringement lawsuit claiming that Rolm Corp.'s Voicemail incorporated Elkins' design.

In September, the case was settled out of court. Elkins signed a licensing agreement with IBM, Rolm's parent company, enabling the firm to use his patent. The inventor said that the settlement vindicates his claim that larger companies are infringing on his patent.

An IBM spokesman said that Voicemail did not infringe on anyone's patent. But why did the compa-

ny settle with Elkins? "The settlement was in the best interest of both parties," he claimed, but refused to clarify that statement.

Since the IBM suit, the law firm has brought suits against Wang and DEC. Elkins claimed that Wang officials invited him to the company, showed him their equipment, tried to convince him that it did not infringe on his patent and offered to settle the case out of court.

He refused. "Wang did not offer me enough money," he said. "They were offering \$25,000 to \$50,000 and various pieces of hardware. That amount was not enough. Wang is going to make a lot of money off of those products."

Wang has filed an answer to the suit and plans to let the court decide if there was an infringement. It is not seeking an out-of-court settlement, a company spokesman said.

Wang's product is based on technology from VMX, Inc. Calls to VMX's patent attorney went unanswered. But an August press release from VMX stated that VMX was the pioneer in voice-messaging technology. Twelve companies, including IBM, have signed licensing agreements with VMX.

A DEC spokesman claimed that it is not DEC's product that infringes on the patent but a product from Voicemail International, Inc. of Santa Clara, Calif., that works with the DEC product. The company plans to incorporate that information in its answer to the charges, which will be filed in two weeks, and is not interested in an out-of-court settlement.

Voicemail International claimed that it had a patent for its technology and that the product does not infringe on anyone else's design.

From page 19

Proteon unshaken by IBM release

media, including baseband and broadband coaxial cable, fiber-optic cable or microwave radio links, Salwen said.

While Proteon's networks use the same architecture and access methodology as defined by the IEEE 802.5 standard, the company drives its nets at higher than recommended speeds.

The 802.5 standard — which Salwen claims was heavily influenced by IBM because of its ardent participation in the standard-making process — specifies a 4M bit/sec. signal rate. Proteon's most popular product is 2½ times faster.

Proteon will match the speed of IBM's Token-Ring Network, but Salwen remains a proponent of 10M bit/sec. and faster local nets. He says an IBM Personal Computer XT user connected to a Novell, Inc. disk server over a Pronet-10 can save a file faster than if that user tried to save the same file on an internal XT drive.

That capability is actually made possible by the fact that Novell's operating system is geared entirely to disk I/O, but the point is that the network does not stand in its way.

According to published reports, IBM's 4M bit/sec. net — which adheres to the 802.5 standard it put so much effort into — will achieve an estimated 200K to 250K bit/sec. throughput.

Salwen, like the heads of so many other small companies, likes to wave off the competitive threat of IBM

with the assertion that its market entrance will validate the technology and the industry. But Proteon will have an initial market advantage because, as Salwen points out, IBM will not build bus interface units for competitors' information processing equipment.

Proteon already builds interface units for Digital Equipment Corp.'s Unibus and Q-bus, Motorola, Inc.'s VME bus and Intel Corp.'s Multibus.

It can be expected that this advantage will wane over time as third-party manufacturers step in and fill the gap, much as the add-on market for IBM's Personal Computers exploded.

But Proteon will still have some tricks up its sleeve. Besides the media flexibility the company offers, options such as its intelligent fiber-optic link will appeal to users. These fiber links are driven by microprocessor-based devices and used to interconnect wire concentrators, the hubs used in most ring architectures.

In the event of a fiber-link failure the intelligent terminating devices close relays in the concentrators at both ends, thus enabling continued operation in those domains.

After such a failure the fiber-optic drivers continually try to reestablish the circuitry by sending out periodic, self-generated test signals. When and if the circuit is reestablished the drivers then open both relays, bringing up the link.

Perhaps Proteon's largest market advantage is that its token-ring networks are available today and they are reputedly easy to install and easy to operate.



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SOFTWARE & SERVICES



Pricing in the Twilight Zone

The reader is asked to conjure up the black-and-white image of a tight-tipped Rod Serling, his arms folded across his chest, the smoke from his cigarette lazily wafting into the gloom overhead. Serling begins:

Tonight you are invited to journey down a road that leads to frustration and stagnation.

They say the grass is always greener somewhere else. But there are times when just getting from here to there seems to be more trouble than it's worth. A change can look so right, a new strategy so inviting. Often, however, the obstacles impeding that change, stalling that strategy, appear insurmountable.

Case in point — the pricing strategy of most software vendors. A strategy that has its roots firmly planted in the Twilight Zone.

The scene now shifts and the tale unfolds...

For one reason or another, the software industry has evolved into a loose collection of players that, with a few notable exceptions, demand that customers pay up front for the right to use their products.

Customer X wants to use Vendor Y's data base management system. So, Customer X plunks down, say, \$250,000 on Day 1 and Vendor Y goes off smiling — for a while anyway. For all the years that Customer X uses Vendor Y's DBMS, he receives maintenance, upgrades and enhancements until the day finally comes when Vendor Y says, "No more" and drops the DBMS from its roster of supported products.

During all those years, Vendor Y earns only marginal revenue in the

Continued on page 31

With a little help from GE

A talk with Robert Healy of Software International

With the help of General Electric Co. and a more than \$6 million development push, Andover, Mass.-based Software International Corp.'s name and product line are back in the applications market limelight. Software International's introduction of its Masterpiece series mainframe applications was only the most recent sign of the company's revitalization, which began in 1981 when GE purchased Software International.

At the company's users group meeting held earlier this month in Washington, D.C., *Computerworld* Software Editor John Gallant spoke with Robert Healy, senior vice-president of marketing and planning for Software International.

Healy discussed GE's influence on Software International, the state of the applications market and what it takes to suc-

ceed as a software vendor.

What changes have occurred at Software International since GE took over in October 1981?

There is a good deal of GE management now in the company. GE is one of the world's largest companies and it is noted for its management skill. There are people in key positions that have the experience that comes from working within a large company. That brought a new level of professionalism to [Software International].

Also, GE has deep pockets. I would say that, given the financial track [Software International] was on, it is questionable whether the company would even exist today if not for GE.

Why do you say that?

[The company] was losing a lot of money and without a Masterpiece-type suite of products, [it] would not be able to go out and stand toe-to-toe with a

Continued on page 29

INTERVIEW



Robert Healy, Software International

SOFTSCOPE

Notes from the software front

Net change. The **Computer Dealers and Lessors Association, Inc. (CDLA)**, based in Washington, D.C., said its CDLA/Net nationwide electronic bulletin board will now be marketed and managed by **Exchange Data, Inc.** CDLA/Net, which has a basic monthly usage charge of \$200, offers electronic mail capabilities and

Continued on page 30

Global banking system debuts

Burroughs Corp. of Detroit introduced a 12-module software system last week aimed at the international banking community.

Burrough's Global Wholesale Banking system, running on its B-1900 series mainframes, addresses a variety of key applications in international banking, including foreign exchange, institutional lending, trade financing, accounting, transaction processing and statutory reporting. The system is built around a core module, dubbed Global Wholesale Management, which establishes operating guidelines for the international

Continued on page 28

INSIDE

D&B Computing Services announced a link between its Nomad2 fourth-generation language and IBM's DB2 relational data base management system /28

NEW THIS WEEK

- CDC enhances Cyber-Epic system
- Massoglia & Associates introduces two packages for IBM System/38

■ For more on these and other new products, see pp. 65-78.

INSTANT ANALYSIS

"We predict IBM's 1985 revenue from software to be roughly \$4.4 billion. Based on its pattern of about 35% compound annual growth, IBM's 1990 software revenue will be close to \$20 billion."

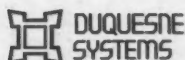
— Bob Djurdjevic
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SOFTWARE & SERVICES

Read-write interface out connecting Nomad2, DB2

D&B Computing Services Co. of Norwalk, Conn., has announced a link between its Nomad2 fourth-generation language and data management system and IBM's DB2 relational data base management system, which runs in IBM MVS environments.

Announced at the recent Nomad2 International Users Conference in Rancho Mirage, Calif., the DB2 link is a read-write interface that treats DB2 tables as masters in a standard Nomad2 data base. The capability is said to allow users to combine the IBM tables with Nomad2 masters and segments into a single Nomad2 data base.

D&B Computing also announced a framework for establishing read-only interfaces to both user-written and other vendors' DBMS. Dubbed General Exit/Database Interface (GEDI), the framework allows users to develop interfaces to specific DBMS. The first GEDI interface is being supplied by D&B for Software Corporation of America's Model 204 DBMS, Version 8.01 in VM and MVS environments.

With the DB2 interface, users can issue commands without leaving the Nomad2 environment by prefacing the commands with "DB2." The in-

terface also provides automated facilities for creating schemas from DB2 tables that prepare them for access by Nomad2. A Schema Reorg function allows users to alter DB2 tables without having to dump and reload data. The same function can be used to convert Nomad2-formatted data for use by DB2.

GEDI reportedly supports Nomad2 security features, but it does not provide access to foreign data dictionaries.

Delivery is scheduled for first-quarter 1986. Pricing for the DB2 interface has not yet been set.

DEC introduces software for Microvax II desktops

Digital Equipment Corp. of Maynard, Mass., has announced that application software, based on its RSX-11 operating system developed for its PDP-11 minicomputers, can now run on the Microvax II desktop minicomputer with Version 2 of the VAX-11 RSX package.

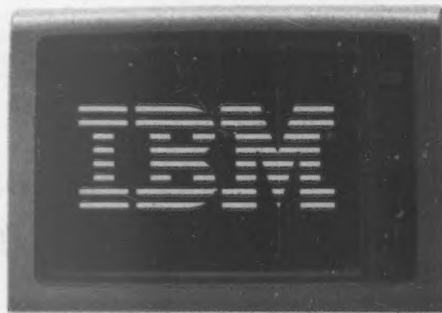
VAX-11 RSX Version 2 is said approximately to double the performance capabilities of the initial version. VAX-11 RSX runs under the VAX/VMS operating system, and it enables any VAX computer from the Microvax II to Vaxcluster systems to be used to develop programs for PDP-

11 minicomputers, PDP-11 microcomputers and Professional 300 series desktop computer systems.

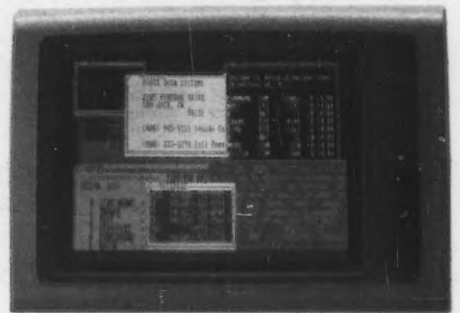
The updated RSX enables users to run RSX-based PDP-11 programs on their VAX systems with little or no modification. Programs developed using VAX-11 RSX can be targeted to run on any of the following PDP-11 operating systems: Micro/RSX, RSX-11M-Plus, RSX-11M, RSX-11S and P/OS.

VAX-11 RSX Version 2 is licensed from \$800 on the Vaxstation II to \$4,000 on other VAX configurations. The product is available now.

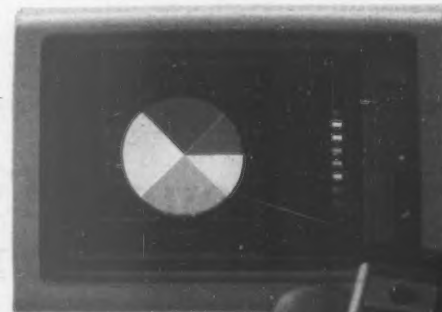
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ForteGraph (for IRMA)™ A whole new look at the mainframe for IRMA™ users. You get all the features of ForteGraph, plus compatibility with ForteNet host file transfer software.



ForteLink SNA™ The link that puts a remote 3274 controller in your PC and allows up to five concurrent host sessions. Like Forte PJ, it's menu-driven and supports ForteNet file transfers. And it's Topview™ compatible.

From page 27

Global banking system debuts

bank and forms the basis for the integration of the other modules.

Using information gleaned from Global Wholesale Banking, a spokesman said, international and wholesale bankers can evaluate and control exposure risk through the system's exposure projection, consolidated reporting and limit control capabilities. Dealers can also obtain real-time data on positions and exposure by client, country or currency type.

Information on such areas as contracts, general ledger structure, accounting models, rates, agents and security levels is maintained within Burroughs' Data Management System II data base management system.

Global Wholesale Banking application modules include foreign exchange, money market, real-time dealer/trader, interbank certificates of deposit, treasury notes, commercial loans, bills and acceptance, documentary letters of credit, statutory reporting for the Bank of England, U.S. statutory reporting, multicurrency client and general ledger accounting.

The system is available now at \$220,000 for all 12 modules.



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SOFTWARE & SERVICES

From page 27

A talk with Robert Healy

[Management Science America, Inc.] and a [McCormack & Dodge Corp.]. [Software International] was slipping back into second-tier status.

Has Software International considered wading into the data base management systems market?

[The company] is an applications expert. DBMS is a marketplace that is maturing in the sense that I don't believe there is room for another new player. I think that ground is pretty well staked out. It would be strictly by acquisition that we would play in that market.

We've heard that lately some of the big vendors that offer a full range of

products are losing out in a lot of deals to more specific niche companies.

Certainly vertical market players have always been strong and always will be. But frankly I see the trend being just the opposite. I think that one of the problems niche vendors face as they build their strategies is that the price of poker has gone way up, in light of offerings like Masterpiece and [M&D's] Millenium. I think it will become increasingly difficult for small niche players to be successful.

Will they have a couple of years to thrive while the big players are delivering on their promises?

I don't think it is going to take that long for delivery. We will be delivering [Masterpiece applications] within 90 days. Once people buy into a Mas-

terpiece-type concept, once they have put in a key application like general ledger, it becomes very tough to go with, say, another vendor's accounts payable package. That becomes a much more difficult decision to make. When people made the general ledger decision a few years ago, they just looked at general ledgers. Today, even though they may not know what they are going to do in the accounts payable area, they are looking at an entire suite of products. That makes for a difficult road for vendors hooked into a single-product sell.

How has the slump affected the software industry in general and Software International specifically?

There is a softness. Decisions have been pushed out. Because revenues have not been quite as vibrant as ev-

everyone had planned, there have been some cutbacks in research programs and in advertising. Development money is where the pressure will really become intense on the smaller, independent players that don't have the resources to continue with the same strategy and wait for better times.

[Software International] has been fortunate. We got our arms around the cost side of our business very early in the year. If revenue had gone the way we had hoped, we would have had a super year in terms of net income. Fortunately, because of good planning, when the revenue didn't happen and we found ourselves sitting 10% or 15% behind on the revenue side, we still had our net on track all the way through July. August was the first time we actually started to slip below the the curve and September continued that trend.

Do you have any idea when the slump is going to end?

I am a believer that when you see IBM's mainframe shipments pick up, that probably six to nine months down the road, you will begin to see significant software purchases. Once the machines are in, people start to look at how they are going to add value to them. I think that probably ties in to a recovery in this industry, sometime in early 1986.

It has been said that the idea of a major software company, a \$200 million software company, is unproven. Every time someone gets close to that plateau they stumble. As Software International grows, is this something that concerns you?

You are dealing with relatively small companies in the software industry. [Management Science America] and [Applied Data Research, Inc.] are large software vendors in a relative sense. But when you compare them to Fortune 500 companies, they are small enterprises. Management isn't always prepared to deal with the changes growth brings. The GE management within our firm has been down a lot of roads before. These people have dealt with the planning and financial problems that come with expanding from a small company to a midsize company to a large company.

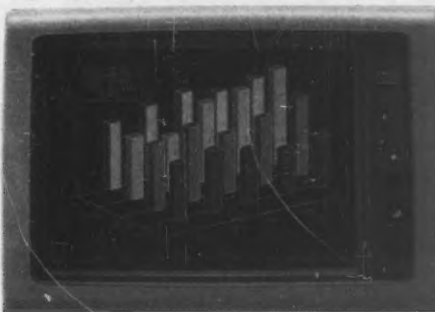
Why is it that at some point along the road everybody seems to trip up, to stall out?

Expanding your product line is not an easy task. Moving from applications to tools, or vice versa, is like changing businesses. That often is not recognized up front and is learned the hard way. The amount of effort required to expand your company is significantly greater than people recognize. ... It is not that easy to bite off new market segments and just roll out a product and expect that you will be a success.

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SOFTWARE & SERVICES

From page 27

Notes from the software front

provides information on tax and legislative issues, industry news, trend reports and other surveys and sales opportunities. It will be linked to Exchange Data's existing Lease-Net, a data base service for equipment lessors, to provide financial data on public companies and sales, use and rental tax rates.

■ 36 special. **Cincom Systems, Inc.** of Cincinnati and Larkspur, Calif.-based **Fusion Products International, Inc.** signed an agreement whereby Fusion will integrate its Fusion/36 decision support system with Cincom's Total data base management system for the IBM System/36. Fusion/36 offers query, report writer and data dictionary capabilities.

■ Languages to go. **Ryan-McFarland Corp.**, the Rolling Hills Estates, Calif.-based vendor of the RM/Cobol and RM/Fortran compilers, penned a distribution agreement with **First Software Corp.**, the nation's second largest software distributor. The agreement involves all versions of the compilers.

■ Ada developments. Santa Clara, Calif.'s **National Semiconductor Corp.** and Chantilly, Va.'s **Verdix Corp.** have inked a licensing agreement that will provide versions of the Verdix Ada Development System for National Semi's Series 3200 32-bit microprocessor family. National Semi will serve as an OEM for the versions. That company will also offer a cross-compiler for Digital Equipment Corp. VAX/VMS computers and Verdix will provide a custom runtime system for the Series 3200.

Also, **Softech, Inc.** of Waltham, Mass., won a more than \$5 million, 22-month modification to its original contract with the U.S. Army Communications Electronics Command at Fort Monmouth, N.J. The contract extension involves Softech's Ada Language System (ALS) Ada programming support environment, built for the Army in 1984. Softech will retarget ALS to a bare VAX — one with no operating system — and to the Intel Corp. 80286 microprocessor.

■ For your information. **Sperry Corp.**, Blue Bell, Pa., has contracted with Newton, Mass.-based **Numerix Corp.** for the joint development of hardware and software interfaces between the Numerix Mars-432 array processor and Sperry's 1100 series computers. The interfaces, scheduled for April 1986 availability, will boast a data transfer rate to and from the Sperry computer of up to 5M byte/sec. and will

enable a number of users to share the array processor. They will also allow several Mars-432s to be configured into one 1100 series system to boost system capability.

■ Of international interest. **NDX Corp.** of Rolling Hills Estates, Calif., has signed England-based **Admiral Computing Ltd.** to market the NDX Creatabase family of information retrieval software in the UK, Europe and the Far East. The NDX prod-

ucts run on Tandem Computers, Inc. processors and IBM MVS- and CMS-based systems.

■ New arrival. The Washington, D.C.-based consulting firm **ICF, Inc.** has formed a wholly owned subsidiary called **Phase Linear Systems, Inc.**, which will distribute software developed by ICF for its clients. The first applications Phase Linear Systems will offer are for IBM mainframe users.

Healthy interest. St. Paul, Minn.-based **Code 3 Health Information Systems/3M** and **IHC Affiliated Services, Inc.** entered into a joint marketing agreement regarding Code 3's medical software, including its **Codefinder**, **DRGfinder** and **CPTfinder** systems, for the IBM System/38.

Code 3 and IHC/ASI recently completed development of the software, which is interfaced to the IHC medical records package.

M's the word. Westboro, Mass.-based **Data General Corp.** will make the **Intersystems Corp.** M package available through DG's Independent Software Vendor program.

M combines an American National Standards Institute version of the Mumps programming language with utilities and data management software.

M is scheduled to be available for DG systems in early 1986.

HOW TO MAKE A GREAT IMPRESSION AT THE OFFICE

SOFTWARE & SERVICES

From page 27

Pricing in the Twilight Zone

form of maintenance fees. In Year 1, when Vendor Y was sitting on the \$250,000 from Customer X, Vendor Y's balance sheet looked great. But in Year 2 and beyond, Vendor Y's balance sheet shows no new income beyond the maintenance fee, which is quickly absorbed by R&D and support projects.

That pricing strategy puts

a lot of pressure on Vendor Y. Vendor Y must continue to sell the DBMS to keep the coffers full and the balance sheet rosy. Also, Vendor Y must sell more and more copies of the DBMS to continue to grow as the owners, stockholders or investors demand. And Vendor Y must continue to improve the product — an increasingly costly enterprise — to continue to sell it.

Vendor Y also has to start thinking about new prod-

ucts. In fact, Vendor Y has to do a great deal more than think. Vendor Y must come up with new products — and ones that are going to sell well — if Vendor Y hopes to stay a player in the software market. Unfortunately for Vendor Y, development and success in the software world is quite expensive and chancy at best.

What's worse, Vendor Y can never really be sure how much money will be available for R&D, marketing,

sales, advertising and so on because Vendor Y cannot say with any certainty how many DBMS or other products will be sold in a given year. The fate of all of Vendor Y's plans rests on sales and the dollars coming in up front. When the market turns sour — and it turned sour this year — Vendor Y's cash flow is reduced to a trickle, and Vendor Y must take knife in hand and trim, trim, trim. That trimming, which at some point must

impact R&D, doesn't do much for the long-term health of Vendor Y.

Why should Customer X care about Vendor Y's financial woes? Because, ultimately, the welfare of users depends on the health of vendors in the software industry. Customer X needs new applications to run on his new hardware — which, by the way, Customer X won't buy if there is no new software to run on it. And, because the business world is getting more competitive, Customer X needs Vendor Y to come up with ever better software systems if Customer X wants to maintain an edge over competitors. Alas, real advances in software technology cannot be made if development programs swell back and forth with the financial tides.

Realizing this, Customer X and Vendor Y agree that it might be better if Customer

With the Hewlett-Packard LaserJet Printer.

Page 2
1985-86, Marketag Report

indicating a lower overall risk than had originally been projected.

Market Penetration

Since introduction in 1976, the product has experienced tremendous growth in all geographical areas. In fact, the only quarter-to-quarter exception occurred Q1-Q2 1980, when the rate of penetration stalled as a result of the \$35 coupon offered by the leading competitor (See Fig. 2a).

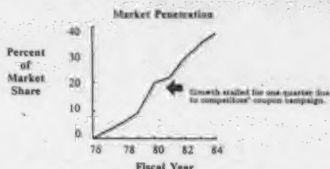


Figure 2a. Market Penetration (all geographic areas)

All regions are contributing to this growth, especially the Southern Region, which is experiencing a growth in market penetration far greater than the industry average. In the last three quarters, the Southern Region has increased at a rate twice that of the same period in the previous year. Figure 2b compares Southern Region and overall company performance with industry growth rates.

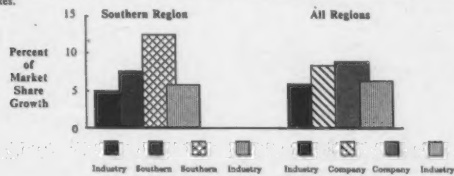


Figure 2b. Market Growth Rate Comparisons

This would indicate that the increased effort directed at the dealers in the South has proved successful. No other elements were altered.

Impact on Profitability

After expenses for the new dealer program, profits have increased 29% in the Southern Region. In the other regions, profits have held steady. This indicates that the ROI for dollars allocated

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HEWLETT
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Real advances in software technology cannot be made if development programs swell back and forth with the financial tides.

X paid Vendor Y a certain sum each year for the right to use the DBMS, say, \$50,000 annually. Vendor Y would have a steadier income stream and could plan more effectively. If Customer X used the DBMS for 10 years, Vendor Y would double its revenue from the product over that span of time. Customer X wouldn't have to shell out \$250,000 up front — ouch! — and could drop, without having paid out the full price, the DBMS later if it wasn't what Customer X really needed or wanted.

The problem is in the getting from here to there. If Vendor Y moved to an annual lease basis, Vendor Y's balance sheet will take a beating in the first year. Long-term benefits aside, a lot of people interested only in the year-to-year financial health of Vendor Y are going to look askance at the new strategy.

The annual lease pricing pasture certainly does look greener. But the fence that separates Vendor Y's yard from that pasture seems so high. If Vendor Y decides to take the lumps and climb that fence, Vendor Y can take heart from one fact. Another vendor — IBM — has embraced the short-term lease policy for most of its software products. And everyone knows who is the most successful software vendor in the world.

Configuration requirements: IBM PC or compatible, HP LaserJet Printer HP-02280F font cartridge, Microsoft Chart™, WordStar™ and Polaris Print Merge™. Polaris Software, San Diego, California (619) 471-0922. Microsoft Chart is a registered trademark of Microsoft Corporation. WordStar is a registered trademark of MicroPro International. Polaris Print Merge is a registered trademark of Polaris Software.

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Albany, NY, Nov. 12

Ft. Lauderdale, FL, Dec. 5

MICROCOMPUTERS



SMALL TALK
Eric Bender
CW Senior Editor

Microsoft tries a power play

"There's a lot of inertia in the business," said Ida Cole, Microsoft Corp. applications vice-president. "We've got to give people a reason to change."

Microsoft hopes that one of the best reasons will be its Excel software, which squeaked in just ahead of its delivery deadline by shipping on the last day of September. An integrated financial analysis package, Excel is impressing many early reviewers, and it carries a clever banner into battle with Lotus Development Corp.'s 1-2-3 — Excel is "for those who understand the uses of power."

Much of Excel's strength and many of its flaws come from its delivery on the Apple Computer, Inc. Macintosh, which is "part and parcel of the product," Cole said. She acknowledged two obvious points: "The soap-opera press that Apple has gotten in the past several months does not warm the Mac in the hearts of corporate America," and Apple has been tardy in delivering related equipment.

The following are other notes from the Microsoft front:

■ Cole described site licensing issues as "a bag of worms" but added that such licenses could turn into a good deal for both customer and vendor.

"Microsoft has not signed a true site license agreement in which, for some incredible sum of money, [it] signs over the right to duplicate [its] disks," she said, but the Bellevue, Wash., company is keeping a close eye on such agreements. Some companies, like Rockwell International Corp., have "very good controls" in place to administer site licensing, she said.

Continued on page 38

Remote micros connect for electronic meetings

By Charles Babcock

NEW YORK — Network Technologies International, Inc. has introduced a multiuser, on-line package for holding meetings via scattered microcomputers, while keeping an electronic record of the proceedings, according to officials for the Ann Arbor, Mich.-based start-up company.

A second recently released product allows lawyers in scattered locations to jointly create and edit a document.

The first package, Eforum, is being marketed by General Electric Information Services Co. of Rockville, Md., to the 6,000 corporate users of its Mark-Net telecommunications network. AT&T Communications of Basking Ridge, N.J., has acquired the rights to market the second package, Docuforum, to corporation lawyers, company spokesmen said.

Eforum runs its communications management on a host computer under AT&T's Unix operating system. But on the workstation version, participants may join the meeting by logging in on their IBM Person-

al Computers or Microsoft Corp. MS-DOS machines. A word processing package built into Eforum can interface with MS-DOS or IBM's PC-DOS and transmit standard ASCII files over a Unix network.

In addition, a user may interface with Eforum through his own word processing system, if that system happens to be Multimate International Corp.'s Multimate, IBM's Displaywrite or Micropro International Corp.'s Wordstar, and call up files from them while logged in to the meeting, according to Jeffrey Elperin, Network Technologies' vice-president for marketing.

As opposed to videoconferencing, not all meeting participants need to be on-line at the same time. The host computer can advance meeting agendas and comments to participants when they log in with the correct password, Elperin said. The software was designed to permit an exchange of information and ideas among members of a scattered group in different time zones or

Continued on page 38

Funk enhances Sideways tool

Version features three file printing programs

Funk Software, Inc. of Cambridge, Mass., has announced an enhanced version of its Sideways spreadsheet printing utility for the IBM Personal Computer.

Version 3 divides the software into three separate programs for printing files from Lotus Development Corp.'s 1-2-3, Lotus' Symphony or other compatible spreadsheet, word processing or scheduling programs, according to a Funk Software spokesman.

The version, scheduled for shipment Oct. 25, reportedly enables 1-2-3 users to read worksheet file formats directly.

The software also enables the use of a

Lotus-like menu to retrieve and display worksheets, select printing options, paint a range or print out, according to the vendor.

Print options

Print options for 1-2-3 files reportedly include borders on three sides of a page, bold, expanded or underlined type and skip-over/print-through paper perforations.

For Symphony users, all formatting and printing features are said to be available from the standard Symphony menu.

Funk spokesmen said that other features of Version 3 include the ability to print IBM's extended ASCII character set.

Sideways Version 3 is priced at \$69.95. Current users may upgrade for \$20, according to the vendor.

INSIDE

Prime introduced the Performer, an OA workstation that can act as a terminal or a stand-alone system /34

NEW THIS WEEK

■ IBM released APL and VS APL for the Personal Computer AT/370

■ Version 3 of PC Paintbrush was released by ZSoft

■ For more on these and other new products, see pp. 65-78.

INSTANT ANALYSIS

"Two of this century's greatest mysteries were solved in the past few weeks. We now know where lies the Titanic, and we now know what all of IBM's networking plans are."

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Oracle announces portable version of IBM SQL/DS and DB2

Any application written for IBM's SQL/DS or DB2 relational database management systems will now run without modification on DEC, DG, AT&T, HP and several other manufacturers' minis, and a wide range of micros, including the IBM PC/XT and PC/AT.

Oracle Corporation introduced the first relational DBMS in 1979. Today ORACLE is the only relational database management system that is completely compatible with IBM's SQL/DS and DB2. Programs written for SQL/DS or DB2 will run unmodified on ORACLE.

Originally designed for IBM mainframes and DEC superminis, ORACLE is now available on a wide range of machines, from mainframes to PCs. And ORACLE includes an integrated set of 4th generation software tools not available with either SQL/DS or DB2.

■ **Why not Cullinet, ADR or Focus?** There is a clearly defined standard for relational database systems. It's called SQL, and it's from IBM. Both ANSI and the US Government are in the process of adopting SQL as the standard database language. The Cullinet, ADR and FOCUS software packages each implement their own unique database language — each one painting the user into

its own corner. Since its inception, Oracle Corporation has provided total IBM SQL compatibility.

Few shops nowadays run only IBM mainframes. Why, then, even consider a database solution that runs *only* on IBM mainframes? Applications written with ORACLE run identically on mainframes, minis, and PCs. Because all versions of ORACLE are identical.

FOCUS, Cullinet and ADR offer either a limited subset, a completely different product or nothing at all (respectively) for the PC. And none have minicomputer products.

■ **Why not just go with DB2 or SQL/DS?** A relational DBMS simplifies but does not by itself eliminate application programming. Additional tools are necessary if users are to create and maintain their own applications.

DB2 and SQL/DS are relational systems, period. ORACLE is a relational DBMS plus integrated 4th generation software tools for application generation, report writing, color graphics and network communications.

Furthermore, SQL/DS and DB2 run only on IBM mainframes (and are somewhat unlikely ever to run on another vendor's system). ORACLE runs on more IBM hardware

and operating systems than do IBM's relational products.

■ **What about Goldengate, dBase III, Symphony or Framework?** PCs need more than PC software if they are to be usefully integrated with corporate data processing. Incompatibility with SQL, while serious, is not the only major problem with these micro packages. None provides an acceptable level of data security, integrity or recovery facilities. And their PC-to-mainframe links are functionally primitive and difficult to use.

To effectively link computers, all machines in the network should run the same software. Only ORACLE provides standard software on mainframes, minis and micros. Data and programs can then be shared among users of different machines, distributing the workload.

ORACLE is currently installed on over 1000 mainframe and supermini systems around the world, as well as on thousands of PCs. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and government agencies.

For further information, contact Oracle Corp., Dept. C2, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 800-345-DBMS

MICROCOMPUTERS

Prime OA workstation debuts as stand-alone, terminal

Prime Computer, Inc. of Natick, Mass., recently announced an office automation workstation that can run in stand-alone mode or as a terminal for its 50 series network.

The Performer workstation, an enhanced Convergent Technologies, Inc. NGEN terminal, is said to be priced 40% below Prime's 2-year-old Producer 100 workstation. Based on the 16-bit Intel Corp. 80186 microprocessor and running Convergent's CTOS operating system, the Performer reportedly runs dedicated word processing, business graphics and Mi-

crosoft Corp. Multiplan spreadsheet software in either stand-alone or network mode.

The Performer is available in a wide variety of configurations spanning a broad price range. A spokeswoman for the minicomputer vendor said the Performer will not run most IBM Personal Computer-compatible software without porting.

Mass storage options

The workstation features mass storage options expandable to 84M bytes and memory expandable to 1M

byte. Fifteen-in. color and 12-in. monochrome monitors are also available.

Additional memory is obtained by plugging 256K-byte expansion cartridges into slots in the processor module. Storage options include a 5¼-in. floppy disk drive, one or two 10M-byte Winchester hard disks and one or two 32M-byte disk expansion modules. The current Producer 100 is expandable only to 16M bytes.

A fully configured cluster Performer workstation supports six users as opposed to the five supported

on the fully configured Producer.

The Performer is priced at \$3,545 for a diskless base configuration. Add-on prices are \$1,895 for the 15-in. color monitor, \$595 for the 256K-byte expansion cartridge, \$3,999 for the 32M-byte disk expansion and \$195 for Multiplan software.

The business graphics software and graphics controller are priced as a separate package at \$1,195, the vendor said.

The Performer workstation is scheduled to be available in November.

Access tool out for Macintosh

Tri-Data Corp. of Mountain View, Calif., has announced the Netway 1000A communications server, a system combining hardware and software designed to enable users of Apple Computer, Inc. Macintoshes on an Appletalk network to access an IBM host computer.

Priced at \$2,525, the Netway 1000A emulates an IBM 3274 controller, allowing Macintoshes on Appletalk to operate as 3278 Model 2 terminals. The Netway 1000A allows up to 16 Macintosh systems to access the IBM host simultaneously.

Unix, GCOS get IBM link

DTSS, Inc. of Hanover, N.H., has announced a micro communications product designed to connect IBM Personal Computers to AT&T's Unix and to Honeywell, Inc.'s GCOS operating systems.

Datapass offers error-checked uploading and downloading of binary or ASCII files across public networks, across local-area networks or over phone lines.

Supported host systems include Unix System III, System V and Berkeley 4.2, GCOS 3 or GCOS 8 and DTSS proprietary operating systems.

Datapass can also be used for personal computer to personal computer

communications.

The product offers terminal emulation, key-selectable sign-on sequences, programmable soft keys, automatic restart and recovery of interrupted transfers and full access to DOS functions without loss of the host connection.

Users can save or print terminal sessions, utilize multiple communications ports and create macros to reduce repeat transactions to a single keystroke.

Pricing for Datapass is \$695 for the Unix host, \$4,900 for the GCOS and DTSS hosts and \$160 for the micro diskettes.

IBM launches Printer Option

IBM has announced the Printer Option, a circuit board and cable that reportedly allows the IBM Actionwriter 1 typewriter to serve as a letter-quality printer for IBM micros.

The option allows the typewriter to print using its normal correspondence print wheel at speeds up to 13 char./sec. The product uses a parallel interface and has light indicators for on/off, on-line/off-line and paper.

Users can reportedly switch the typewriter from typing to printer mode and back with one button.

Cost of the Printer Option is \$260.

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Next, we give departments the tools they need to plan and execute winning strategies. It's easy because DPS 6 systems

are versatile. So your sales and marketing offices can have just the systems and applications they need while accounting and purchasing have theirs. All able to communicate instantly. Honeywell gives you all this without breaking the bank, because all our systems are designed to provide you with a clear growth path that evolves with your needs.

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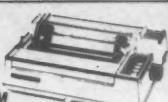
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COMPUTER CORPORATION

MICROCOMPUTERS

From page 33

Remote micros connect meetings at different times of day.

An attendee may periodically call up the latest comments or the entire transcript as other participants add their comments to the proceedings, Elpern said.

Eforum lists for \$150 for the single-user workstation version. A multiuser version for the AT&T 3B2/300 computer costs \$2,500 and for

the 3B2/400, \$5,000. The latter theoretically will support up to 2,000 users, but Elpern acknowledged that performance depends on intensity of use and number of users.

In addition to the Eforum software, a user will need a host computer as well as a micro for each participant. The host can be one of several machines capable of running Unix, including AT&T's 3B line or a Digital Equipment Corp. VAX. The smallest host possible is an AT&T

Unix PC, which can support from 20 to 80 users. Eforum customers also may rent host time from Network Technologies at \$26 per hour.

The second product, Docuforum, was conceived by AT&T Communications after the firm researched the needs of corporate legal departments. Network Technologies developed a prototype of the concurrent multiuser, text editing package to run under Unix, and the package is still capable of being accessed by IBM Personal Computers or compatibles.

After reviewing the prototype, AT&T Communications and Network Technologies signed a contract through which Network Technologies would develop the product and AT&T would have exclusive rights to market it to corporate legal departments. Network Technologies plans to market it to other potential users, Elpern said.

Docuforum reportedly permits lawyers in different locations to produce, comment on and edit text and exchange the resulting document with other lawyers. List prices for Docuforum are \$4,000 on a 3B2/300, \$7,500 on a 3B2/400, \$12,000 on a 3B5 or DEC Microvax, \$20,000 on a 3B15 or VAX 750 and \$38,000 on a VAX 780-785.

Elpern said Network Technologies has raised \$20 million to develop and market Eforum, Docuforum and successive products.

From page 33

Microsoft tries a power play

■ Despite all the talk this year about the Association of Data Processing Service Organizations, Inc.'s proposal for a lock-and-key setup, there are no near-term plans to launch the idea with any Microsoft applications.

■ "The religion at Microsoft is graphical user interfaces," Cole said. In her view, IBM microcomputers suitably equipped with add-on boards finally offer that at an affordable price, and Microsoft's Windows operating environment ("which cost us a bloody fortune") will be the key. Sometime next year Microsoft will offer Excel-like software for the IBM Personal Computers and other machines under Windows.

■ At Microsoft, "we have not yet come up with true IBM mainframe communications links," she said. However, the recent move in local-area network applications is a step in the right direction, and offerings from third-party vendors are beginning to fill in the gaps between Microsoft packages on the desktop system and mainframe applications, she maintained.



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SYSTEMS & PERIPHERALS



HARD TALK
James Connolly
CW Senior Editor

What's a 'microsuper'?

In days of old, say, back in 1970 when engineers sauntered through corridors with holstered slide rules swinging at their hips, large companies and universities had what they called "computers."

Those in the know, people who had access to locked, chilled, glass rooms, called their computer "the system." That was it: slide rules, systems and, of course, paper.

But all of that was before marketing people came distinctions. One company sold mainframes, another minicomputers and, eventually, microcomputers and supercomputers. Perhaps, an argument could be made for each of those four labels.

Then, as technology progressed and the 1970s faded into distant memories, justification for some computer classifications became strained. Marketers for every generation of computers at each level weren't happy with using existing labels or even with having their products called "high-end systems." Thus, supermini, supermicro and, within the past year, minisuper drifted into press releases and sales pitches.

Who knows what sets a supermini apart from a mini? If it is 32-bit processing, then how does a supermini differ from a supermicro? If it's the number of users, how do you tell a supermini from a mainframe? Who cares, particularly when there are more pressing issues in the world: inflation, war, hunger and the lack of good television entertainment?

What computer buyers really want to know is whether a system will address their needs, how fast and reliably it will run their own applications and with what existing products it compares. It is these types of questions that readers of *Computerworld* ask in daily telephone calls and letters to the newspaper.

What computer vendors and their
Continued on page 44

DEC beefs up Microvax II

Increases storage capacity of supermicrocomputer, adds hard-disk controller

Digital Equipment Corp. of Maynard, Mass., has released a new configuration of its Microvax II supermicrocomputer that is said to provide users with as much as 1G byte of mass storage in one system cabinet.

Concurrently, the company announced a faster throughput controller for its 5¼-in., 71M-byte hard disks that is said to increase disk performance for all Microvax II configurations.

The high-end system, housed in a 40-in. cabinet, is the fifth Microvax II system configuration available from the company, a spokesman said. The configuration enables users to connect as many as 33 serial lines to the system, compared with a maximum of 21 lines for earlier versions.

The basic configuration costs \$42,505 and consists of a Microvax II processor with 5M bytes of memory, a controller for 456M- and 205M-byte disks, a 95M-byte ¼-in. streaming tape cartridge drive,
Continued on page 40

Financial printing firm will try configuration in typesetting operation

By Donna Raimondi

NEW YORK — It is not every day that a user's needs and a vendor's solution coincide so neatly. For Pandick, Inc., Digital Equipment Corp.'s release of added storage capacity on its Microvax II prompted a decision that could decentralize business applications and cut the cost of typesetting operations in the company.

The financial printing firm has ordered two Microvax IIs with 650M bytes of storage on each for its New York headquarters to verify that the machines will live up to expectations, according to John Reilly, director of business systems. If all goes well, and Reilly said he expects that it will, at least 20 Microvax IIs will be installed to perform typesetting functions — two in each of 10 full production facilities Pandick operates around the country.

The move could cut the company's typesetting and financial computing costs dra-
Continued on page 44

INSIDE

Adra Systems introduces a Motorola 68010-based CAD system /40

NEW THIS WEEK

- Memorex unveils a Model 2024 printer
- Canon releases its Group III laser facsimile
- Apollo introduces two Tempest workstations

■ For more on these and other new products, see pp. 65-78.

INSTANT ANALYSIS

"IBM's competitors face an unenviable task: They are expected by end users to communicate easily with IBM computers, which is something IBM computers themselves are not very good at."

— International Data Corp.'s
EDP Industry Report

BITS & SLICES

Large systems industry news

The following are observations on developments in large systems:

IBM's entry into supercomputing, with a vector processor for the IBM 3090, brought the usual reaction.

IBM analysts said the product was so-so in performance and overpriced, but supercomputer manufacturers and plug-compatible manufacturers should watch out because IBM is never satisfied with a small chunk of a market. They predicted a line of vector processors running up and down the IBM product line.

The plug-compatible manufacturers such as Amdahl Corp. and National Advanced Systems Corp., which mar-
Continued on page 40

Mid-line Zebra product debuts

General Automation, Inc. of Anaheim, Calif., has unwrapped a mid-level multiuser business computer in its Zebra line of systems. The Zebra 3750 will fit in between the company's low-end Zebra 1750 and high-end Zebra 5500E machines.

The Zebra 3750 runs under Pick Systems' Pick operating system. It includes a word processing system that is part of the Pick system, Raymond-Wayne Corp. of Phoenix's Compu-Sheet spreadsheet and Accu-Soft Enterprises of Sunland, Calif.'s Accu-Plot business graphics.

It features a Motorola, Inc. 68000-based CPU; 512K bytes of memory (expandable to 2M bytes); 64M to 256M bytes of fixed Winchester disk storage; a ¼-in. streaming cartridge tape drive (45M-byte to 60M-byte capacity) for backup; six to 38 asynchronous terminal or serial printer ports; and one parallel printer port.

In its base configuration, the Zebra 3750 costs \$29,750.

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*Based on inventory for Vehicle Leasing and Services Division, which does business as Ryder Truck Rental, source 1983 Ryder Systems, Inc. Annual Report and Third Quarter Report, 1984

SYSTEMS & PERIPHERALS

From page 39

Large systems industry news

ket vector processors for their Japanese-made mainframes, reported that they were thrilled with IBM's price/performance figures. Naturally, they felt they could do better.

Seymour Cray, founder of supercomputer manufacturer Cray Research, Inc., said that his company will respond to IBM's announcement by continuing its effort to sell to the high end of the scientific market. Although Cray Research has some cross-development agreements with IBM, Cray said that his company was not involved in development of the new IBM product.

Answering questions after a presentation to French clients, Cray seemed unperturbed by the IBM an-

nouncement but dryly added, "I guess I should get back to work."

The vector processor could have sociopolitical repercussions in some organizations. Noting that engineers and scientists have worked for years to acquire their own \$400,000 scientific processors, International Data Corp. analyst Frank Gens said those technical users may see their applications moved back to the mainframe. "It raises the question of whether users have to get back into bed with DP," he said.

Those who were waiting for IBM to announce a high-end model of the 4381 mainframe said they were unimpressed by the memory upgrades for the 4361. They noted that the added ability for 4361s to use the 3480 tape system was encouraging

but that the more important move will be allowing the 4361 to use the 3380 disk drives that the 3480 is designed to back up.

Having all those Wang Laboratories users congregated in Boston for the company-sponsored International Society of Wang Users (ISWU) from Sept. 30 to Oct. 2 promoted an independent exposition as well. Wang seemed to ignore a show called Index '85 sponsored by the new Wang User Society of America (WUSA) that was held only three blocks from the main event.

Showgoers did not ignore the independent group, however. "I feel as if I have just discovered America," said an ISWU attendee who happened to find WUSA's Index '85. The Nynex Corp. employee, who did not want to be identified, found a soft-

ware package at Index '85 that cost \$1,400 and will pay for itself in about three weeks, she said. The package — from Easylink Service of Upper Saddle River, N.J. — will reside on the Wang VS 100 and will enable executive secretaries to transmit telexes directly around the world.

The attendee said she was also happy with the official ISWU show. Based on what she and her colleagues learned at last year's ISWU convention, they were able to create systems and communications that made their jobs much easier.

Meanwhile, Wang officials said the firm will release a version of its Wang Office product in the spring of 1986. That version will include programming hooks into the communications aspects of the system for application development by third-party vendors and in-house programmers.

The application programming interface subroutines have been released to a group of about 25 Wang-selected third-party vendors already, said Charles Magliato, program manager for Wang Office. The hooks should allow developers to access functions of the electronic mail, messaging and directory services within Wang Office.

The development efforts likely will be geared to departmental office functions of large companies, such as accounting and purchasing; to production applications like spreadsheet, decision support and graphics; and to applications like distribution or legal systems, Magliato said.

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Adra unveils CAD system

Adra Systems, Inc. of Lowell, Mass., has released a computer-aided design and drafting system that supports the Iges 3 file transfer protocol.

The Adra 1000 includes a Motorola, Inc. 68010 processor, 2.5M bytes of main memory, a bit-slice graphics processor, a 19-in. 1,024-by 1,024-pixel monochrome display, a keyboard, a graphics table, a stylus and an 800K-byte diskette drive.

The system, which costs \$15,750 in single quantities, also includes Adra's Cadr-II design and drafting software. It can be integrated into computer-aided design and manufacturing systems or can function as a stand-alone system.

From page 39

DEC increases storage of supermicrocomputer

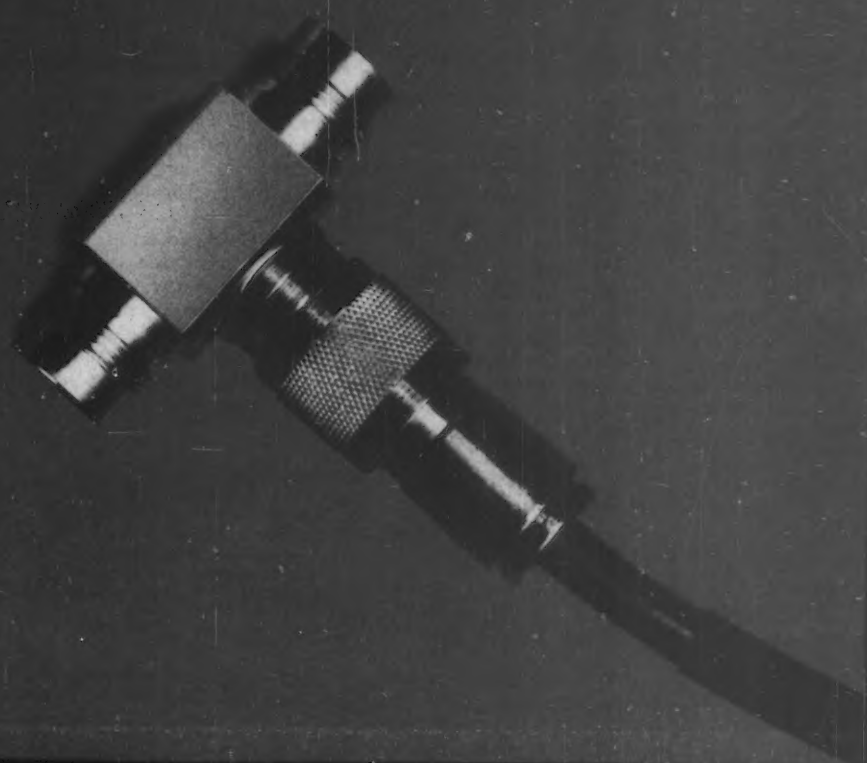
an eight-line asynchronous multiplexer and Decnet/Ethernet interface.

The user must choose either the RA81 456M-byte Winchester-type 14-in. disk drive that costs \$18,640 or the RA60 205M-byte removable-media 14-in. disk drive that costs \$17,140 and an operating system license, according to the vendor.

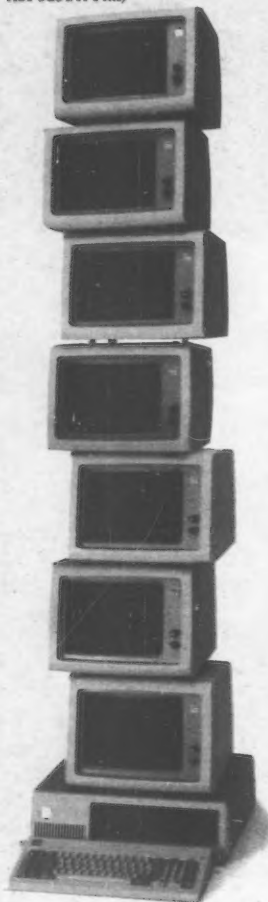
Up to two 456M-byte disks or one 456M-byte and one 205M-byte disk can be installed in the processor's cabinet. A second standard disk cabinet with three disks can be added for \$50,000. This gives disk capacity totaling up to 2G bytes of storage, the vendor said.

12

More Reasons
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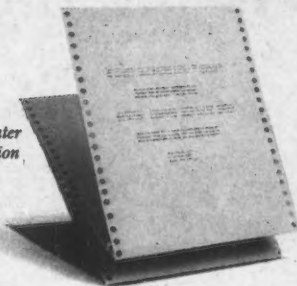


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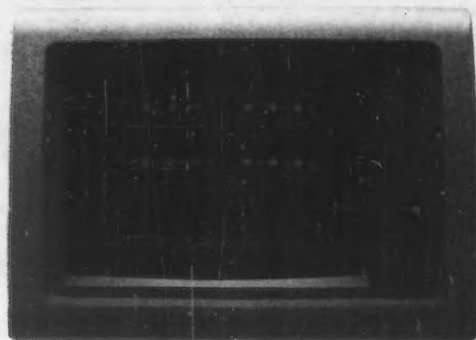
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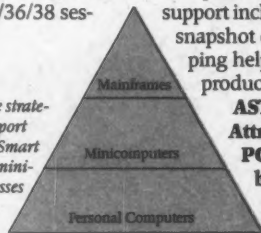
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network gateway connections we've established worldwide, that we've already made a substantial commitment to helping people realize their fundamental visions of the "smart office."

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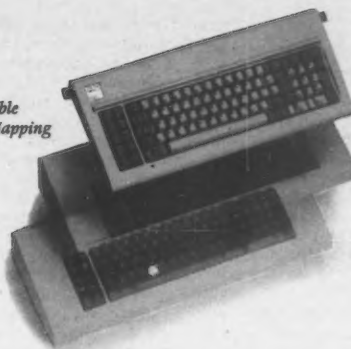
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SYSTEMS & PERIPHERALS

From page 39

Printing firm to try configuration

matically, Reilly said. It will also cut in half the space needed for his systems.

The Microvax configuration Pandick bought is about half the size and two-thirds the price of similarly configured DEC VAX-11/750 machines, which Reilly had been considering to do the job.

Until now, it has not been

cost-effective for the company to implement decentralized business applications. But because of the Microvax's enlarged disk capacity, up to 1G byte in a cabinet, it is now a viable system for Pandick's typesetting needs, Reilly said.

Having the machines in all 10 regions for typesetting would leave enough capacity to add on the Ross Systems, Inc. financial software that currently resides on the company's three PDP-11/70s and

on a VAX-11/750 at headquarters.

"We were looking at [distributed VAX-11/750s] two years ago and that would have been very expensive," Reilly said.

Each of the 10 locations now has anywhere from two to six PDP-8s that were installed starting in 1973 for typesetting. The PDP-8s are tied to the main office by leased lines. When the Microvax IIs are implemented, they will be tied together via

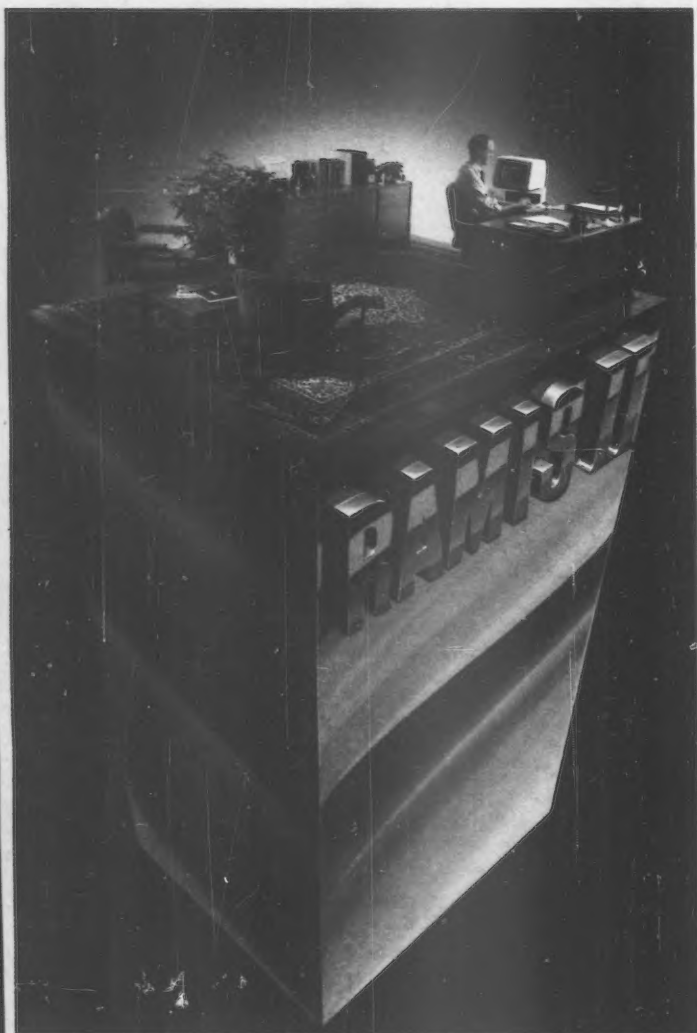
DEC's Decnet networking facility.

The typesetting itself is nothing but elaborate word processing, Reilly said. Pandick had Datalogics, Inc. of Chicago — a publishing and printing software development firm that has written composition software for Pandick — run benchmark tests to measure the Microvax's typesetting performance. Datalogics compared the Microvax II with the VAX-11/780.

Performance on the smaller machine, using some CPU-intensive standard composition software, exceeded that of the VAX-11/780 by about 5% in CPU time tests and was about equal in clocked time tests, according to Chuck Myers, vice-president of Datalogics.

The Microvax II disks were a little slower than the VAX-11/780 disks, he said, which accounted for the equivalent real-time performance.

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From page 39

What is a 'microsuper'?

marketing types have done with their classifications, regarding issues of performance is confuse, not help, the customer.

Recently, one vendor came up with another handful of mud to cloud, rather than clear, the water.

Masscomp, also known as the Massachusetts Computer Corp., announced a new classification of computers — the micro supercomputer.

Masscomp casually dropped names like Cray Research, Inc. while putting its MC5000 series up against almost everything from single-user supermicros to Digital Equipment Corp. 8600s and the still-undefined minisupercomputer class. The implication was that one can now use a \$15,000 tabletop system to do the work of a \$7 million Cray 1 supercomputer.

The Masscomp ploy was simple: invent a classification and a definition that happens to match its own product line and hope that people will think of Masscomp when they think of micro supercomputers.

Naturally, Masscomp offered performance figures that showed its systems to be best buys. That is the company's right, and it is the type of salesmanship used for thousands of years.





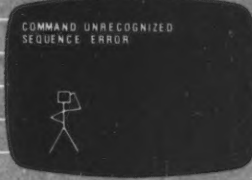

But Masscomp could have done a favor for potential customers or for the casual newspaper reader. All the company needed to say was that it runs compute-intensive and floating-point applications in a small-scale system and then offer its benchmark results, with a cost comparison to existing systems, such as much of DEC's VAX line.

Masscomp could have made a strong case for its systems just by relying on its facts. Instead, the company played the name game in hopes that the media would jump on board. Masscomp isn't the first to do that and certainly won't be the last. But the company would have done users a service by adopting the stance of *Dragonet's* Sgt. Joe Friday — "Just the facts, ma'am, just the facts."

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IN DEPTH

Does your DBMS run by the rules?

To be "mid-80s" fully relational, a DBMS must support all 12 basic rules plus nine structural, 18 manipulative and all three integrity rules. There will be more requirements by the 1990s.

By E. F. Codd

Last week, the originator of the relational model described the 12 rules by which to measure any DBMS claiming to be relational. This week, Dr. E. F. Codd presents the practical consequences of his 12 rules as well as 30 additional features of a relational system. Then he asks vendors to measure up.

Part 2

No existing DBMS product that I know of can honestly claim to be fully relational at this time. The proposed ANSI standard does not fully comply with the relational model, so a DBMS' fidelity to the ANSI standard is no guarantee of relational capability. The standard could be modified, but already vendors are well advised to extend their products beyond the standard to support customers' DBMS needs fully.

In their ads and manuals, vendors have translated the term "minimally relational" to "fully relational," so more stringent criteria must be applied. Twelve rules (below) comprise a test to determine whether a product that is claimed to be fully relational is actually so. A grading scheme used to measure the degree of fidelity to the relational model follows.

A DBMS advertised as relational should comply with the following 12 rules:

1. The information rule.
2. The guaranteed access rule.
3. Systematic treatment of null values.
4. Active on-line catalog based on the relational model.
5. The comprehensive data sublanguage rule.
6. The view updating rule.
7. High-level insert, update and delete.
8. Physical data independence.
9. Logical data independence.
10. Integrity independence.
11. Distribution independence.
12. The nonsubversion rule.

E. F. Codd originated the relational model for data base management. He led the team that designed and implemented the first operating system with multiprogramming capability. This year he established two companies with Chris Date: The Relational Institute and the Codd & Date Consulting Group, both based in San Jose, Calif.

IN DEPTH/RELATIONAL DBMS

These rules are based on a single foundation rule. I call it Rule Zero:

For any system that is advertised as, or claimed to be, a relational data base management system, that system must be able to manage data bases entirely through its relational capabilities.

This rule must hold whether or not the system supports any nonrelational capabilities of managing data. Any DBMS that does not satisfy this Rule Zero is

not worth rating as a relational DBMS.

But compliance with Rule Zero is not enough. Failure to support the information rule, guaranteed access rule, systematic nulls rule and catalog rule can make integrity impossible to maintain.

These four rules support significantly higher standards for data base administration and control (authorization and integrity control) than earlier DBMS supported. Users should remember that a

data base managed by a relational DBMS is likely to have both experienced and inexperienced users; it must be able to serve both.

Rule Zero not enough

Rules 1 and 4, the information and catalog rules, allow people with appropriate authorization (such as executives of the company) to find out easily via terminal what information is stored in a data base. I have encountered data base administra-

tors using nonrelational systems who were unable to determine if a specific kind of information was recorded in their data base.

Rule 3, which calls for the inclusion of systematic support for unknown and inapplicable information by means of null values that are independent of data type, should help users to avoid foolish and possibly costly mistakes. The treatment of nulls, when aggregate functions such as total and aver-

age are applied, holds considerable interest for users. The Oracle DBMS in particular has an outstanding approach to null values. The user may specify whether the aggregate function is to ignore null values or yield a null result if any null value is encountered.

In general, controversy still surrounds the problem of missing and inapplicable information in data bases. It seems to me that those who complain loudly about the complexities of manipulating nulls are overlooking the fact that handling missing and inapplicable information is inherently complicated. Going back to programmer-specified default values does not solve the problem.

Rule 5, the comprehensive

??

The ANSI standard as now proposed is quite weak. It fails to support numerous features users need to reap the advantages of the relational approach.

data sublanguage rule, is important for several reasons. First, it allows programmers to debug their data base statements interactively, treating them separately from whatever nondata base statements occur in their programs — a significant contributor to productivity. Second, it means that a single tool can be used for defining relations derived from the data base, whatever the purpose. The view updating rule, Rule 6, is vital for the system to support logical data independence.

Rule 7, which requires a multiple-record-at-a-time attack on insertion, update and deletion, can help save a good portion of the total cost of intersite communication in a distributed data base. If the system includes a good optimizer (an important component in relational DBMS performance), this rule can also result in substantial saving of CPU and I/O time, whether the data base is distributed or not.

Failure to support independence (Rules 8 through 11) can, and very likely will, result in skyrocketing costs in both money and time. Developing and maintaining applications programs and terminal activities will be more expensive. Managers may even be unwilling to consider changing certain business policies simply because of the anticipated program maintenance costs.

Rule 12, the nonsubversion rule, is crucial in protecting the integrity of

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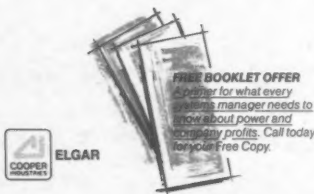
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IN DEPTH/RELATIONAL DBMS

relational data bases. All too frequently, I have seen situations in which data base administrators with nonrelational DBMS failed to control their data bases adequately; consequently, they could not maintain a state of integrity.

Domains

Many users confuse the domain concept with the concept of attribute of a relation or column of a table. Other people (often the vendors themselves) dismiss the domain concept as "academic." My reply to them is: The atom bomb was also academic!

In fact, the domain concept is very important, practical and simple. A domain consists of the whole set of legal values that can occur in a column. The column draws its values from the domain. Each column of a relational data base has precisely one domain, but any number of columns may share a domain. There are several reasons why domains should be supported.

For example, in a financial data base, there may be as many as 50 distinct columns (possibly, but not necessarily, in distinct tables) defined around the U.S. currency domain. Why repeat the definition of currency 50 times? In data bases supported by nonrelational systems, I frequently observe many inconsistent declarations of value type for fields that were intended to have the same type.

It is unreasonable to expect a DBMS to store all the legal values in a domain, unless there happen to be very few. However, it is entirely reasonable — and very worthwhile — to insist that a DBMS should store certain values:

- For each domain, a description of the type of values in that domain. This information is global since it applies to the entire database, and it should of course be recorded in the catalog.

- For each column, the name of the domain from which that column draws its values. This domain name is a reference to the global definition.

Of course, the domain description can include range restrictions. For example, it could specify that quantities of parts in an inventory must not only be integers, they must also be non-negative.

Furthermore, individual columns may include additional range restrictions where these are semantically justifiable. In this example, the quantities of very expensive parts held in the inventory may be limited to some specified maximum.

One of the benefits of supporting the domain concept is that, in cases where several columns share a common domain, the declaration of the description of the legal

values is largely or even completely factored out. For example, when there are 50 distinct columns defined on U.S. currency, the data base is much easier to manage and manipulate if one avoids making 50 distinct declarations for U.S. currency.

Before the relational discipline arrived, users had to make separate declarations, and as a result, many of the 50 in the example would turn out to be incompatible with one another by accident.

The factoring of declaration that prevents these errors is achieved in Digital Equipment Corp.'s RDB, which has a concept of "global field definition." But RDB fails to support domain constraints on certain operations, such as join.

Another benefit of supporting the domain concept is that relational operators, such as joins and divides, that involve comparison of values between different columns can be constrained by

the system. A DBMS can allow data base values to be compared only when they come from the same domain and are therefore comparable from the semantic viewpoint.

Such a constraint inhibits errors caused by interactive users of terminals who choose columns to be compared in such operations as joins. The wrong answers they obtain from these errors rarely uncover the errors themselves; meanwhile,

unwise business decisions may be made based on these wrong answers.

For various reasons, it is important to support as a qualifier in a command what I call "semantic override" — the ability to have the system ignore the usual comparison constraints. Users should be able to authorize this override qualifier separately from the operator involved and should authorize it rarely, reserving it chiefly for detective work.

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IN DEPTH/RELATIONAL DBMS

Even when the domain concept is restricted to assigning types to data, it should not be confused with the hardware-supported data type. Consider the example of a data base listing suppliers, parts and projects. Suppose the hardware-supported data types of supplier serial numbers and part serial numbers are identical: each type consists of fixed-length strings of 12 characters. The system still needs to keep these two data types distinct and remember which columns are defined on one and which columns are defined on the other.

If it can make these distinctions, then when a request comes in to delete or archive all records containing X3 as a supplier serial number, the system can handle such a transaction correctly. The system will not delete or archive any record that contains X3 as a part serial number and that also does not contain X3 as a supplier serial number.

Today, such a data type is often called an application data type. The concept is supported in Pascal but in very few other languages that enjoy current use. The Pascal support does not, of course, include constraints on selects, unions, joins and divides.

The domain concept is basically what makes all the meaningful selects, unions, joins and divides known to the DBMS. Thus, the domain makes the data base meaningfully integrated, and it does so without prejudicing distributability.

Contrast this with CODASYL links and IMS hierarchic links. They represent the CODASYL and IMS con-

Fidelity to the 12 rules (by DBMS)			
Rule	DB2	IDMS/R	Datacom/DB
1 Information rule	Yes	No	No
2 Guaranteed access rule	Partial	No	No
3 Systematic treatment of nulls	Partial	No	No
4 Active catalog based on resource management	Yes	No	No
5 Comprehensive data sublanguage	Yes	No	No
6 View-updating rule	No	No	No
7 High-level insert, update, delete	Yes	No	No
8 Physical data independence	Yes	Partial	Partial
9 Logical data independence	Partial	No	No
10 Integrity independence	No	No	No
11 Distribution independence	Yes	No	No
12 Nonsubversion rule	Yes	No	No
Score (1 for yes, 0 otherwise)	7	0	0

Figure 1

cept that a link "integrates an otherwise unintegrated data base," but they have several unfortunate restrictions. Most importantly, they obstruct data base distribution because of the constraints and complexity their data structures introduce into decisions regarding how the data should be deployed.

A second serious drawback of links is that they are only paths. Generation of a result such as a join requires traversal of these paths by the application program. It seems superfluous to cite other difficulties with this concept.

Many relational DBMS and languages including SQL do not support

the concepts of primary key and foreign key. I fail to see how these products can support the guaranteed access or the view updating rules without making the system aware of which column(s) constitute the primary key of each base table.

Furthermore, I fail to see how these products can support referential integrity or the view updating rule without offering clear support for both primary keys and foreign keys. For example, in SQL, the CREATE TABLE command should be extended to permit the user to declare which column or columns constitute the primary key and which constitute foreign keys. In addition, there

should be a new CREATE DOMAIN command in SQL.

Fidelity

Figure 1 shows fidelity to the 12 rules by IBM's DB2, Cullinet Software, Inc.'s IDMS/R and Applied Data Research, Inc.'s Datacom/DB — examples chosen for their wide differences. These scores represent counts of compliance with each rule (score one for "yes" and zero for either "partial" or "no").

Actually, the information rule is so fundamental to the relational approach that a system's compliance with this rule should receive a much higher score than one. Weighting it as high as 10 would not be excessive. However, I shall avoid assigning different points for different features, just as I avoided a fractional score for partial support of a feature: It is too easy to be subjective in these matters.

DB2 scores quite well on the fidelity evaluation. Very few other DBMS score higher on the 12 rules, although some others score equally well. Both IDMS/R and Datacom/DB allow information to be represented in the order of records in storage and in repeating groups — directly violating the information rule. In the case of IDMS/R, information may also be represented in links between record types (CODASYL calls them "owner-member sets") and also in "areas."

Some vendors of nonrelational DBMS have quickly added a few relational features — in some, cases, very few features — in order to be

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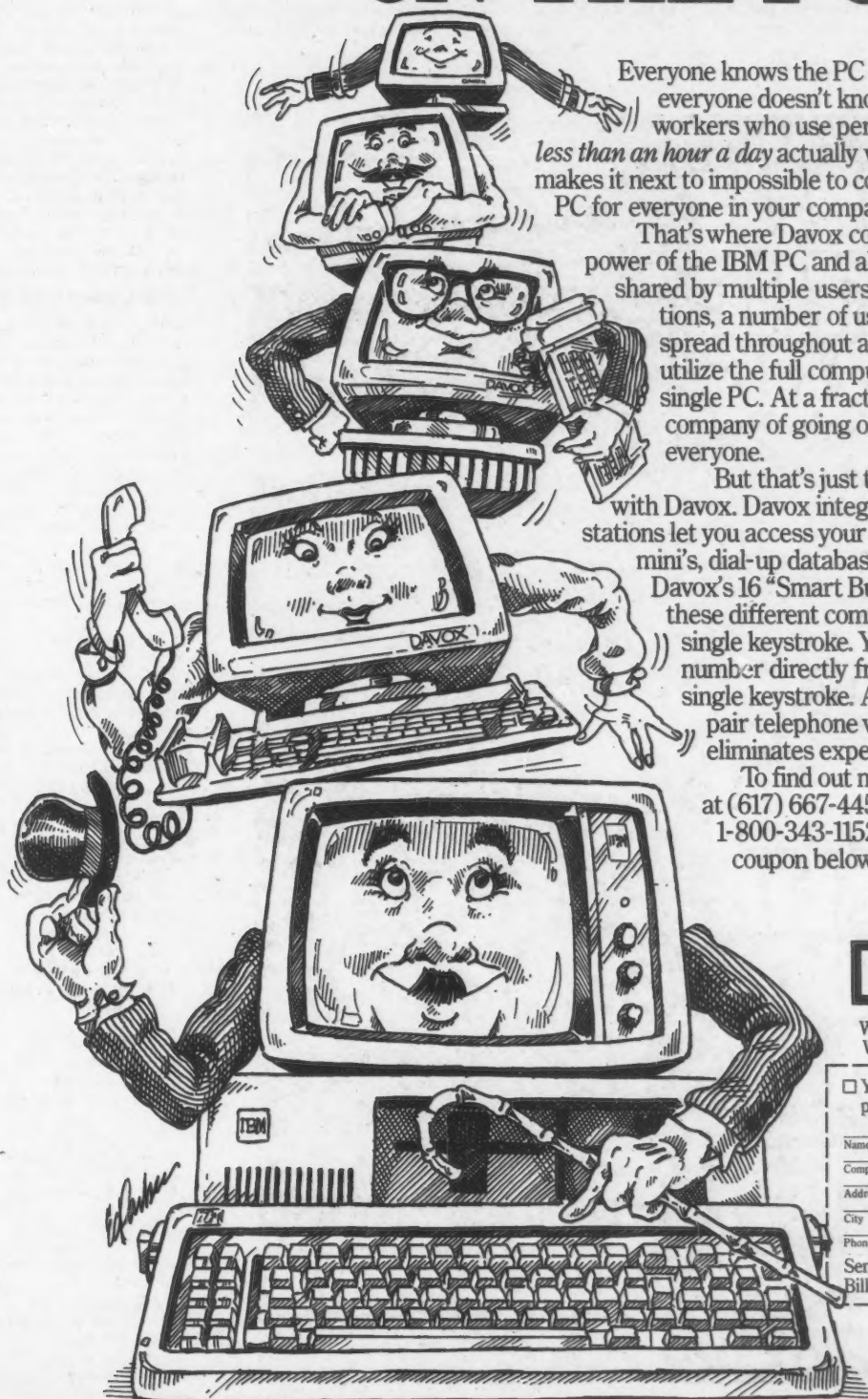
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IN DEPTH/RELATIONAL DBMS

able to claim their systems are relational, even though they may not meet simple requirements for being rated minimally relational.

These "born-again" systems keep their lower level languages (single record-at-a-time) open to users either to support compatibility with previously developed application programs or because the vendor takes the position that relational operators are applicable to query only.

In view of this, such systems fail to support the non-subversion rule — a heavy penalty to pay for compatibility. IDMS/R and Datacom/DB are both born-again systems, and both fail to support the nonsubversion rule for integrity.

Features of the model

For a more detailed evaluation of DBMS, users can compare a system to the nine structural features, the 18 manipulative features and

the three integrity features of the relational model. Each feature is defensible on practical as well as theoretical grounds.

The nine structural features are as follows:

S.1 Relations of assorted degrees — or equivalently tables with unnumbered rows, named columns, no positional concepts and no repeating groups.

S.2 Base tables representing the stored data.

S.3 Query tables — the

result of any query is another table, which may be saved and later operated upon.

S.4 View tables — virtual tables that are represented internally by one or more relational commands, not by stored data. The defining commands are executed to the extent necessary when the view is invoked.

S.5 Snapshot tables — tables that are evaluated and stored in the data base, together with an entry in the catalog specifying the date

and time of their creation plus a description.

S.6 Attributes — each column of each relational table is an attribute.

S.7 Domain — the set of values from which one or more columns obtain their values.

S.8 Primary key — each base table has one or more columns whose values identify each row of that table uniquely. The primary key provides the unique associative addressing property of the relational model that is implementation, software and hardware independent.

S.9 Foreign key — any column in the data base that is on the same domain as the primary key of some base relation. The foreign key serves as an important part of the support for referential integrity without introducing links into the programmer's or user's perspective.

Manipulative features

It is important to keep in mind that the relational model does not dictate the syntax of any DBMS language. Instead, it specifies the manipulative capability (that is, power) that a relational language should possess. At the same time, the model does not require the user to request the data base administrator to set up any special access paths, nor does it require the user to resort to iterative looping or recursion or Cartesian product.

The model also does not require the system to generate a Cartesian product as an intermediate result. In early papers this manipulative capability was expressed in two ways: algebraic and logic-based. The two ways were then shown to be of equal power.

This article uses the algebraic method of expressing the manipulative power, for explicative reasons.

The manipulative features are as follows:

- M.1 theta select
- M.2 project
- M.3 theta join
- M.4 outer theta join
- M.5 divide
- M.6 union
- M.7 intersection
- M.8 set difference
- M.9 outer union
- M.10 relational assignment

- M.11 theta select maybe
- M.12 theta join maybe
- M.13 outer theta join maybe
- M.14 divide maybe

- M.15 theta select semantic override (s/o)
- M.16 theta join s/o
- M.17 outer theta join s/o
- M.18 divide s/o

In the list above, "theta" stands for any one of the comparators: equal, not equal, greater than, less than, greater than or equal to, less than or equal to.

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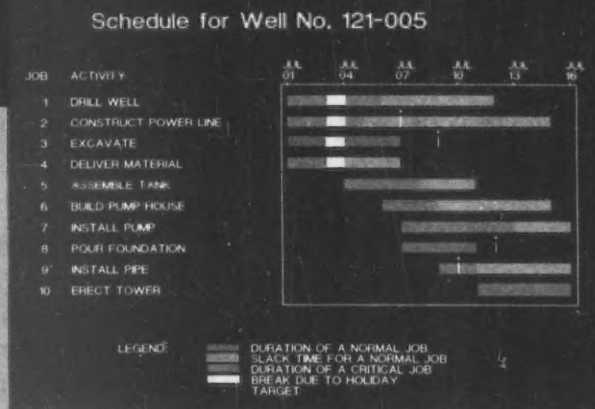
Command (---) Parameters: Scheduling System

Project: 121005 Schedule for Well No. 121-005

Start Date (ddmmyy): 01Jul85

Holiday (ddmmyy): 04Jul85

Activity	Duration	Task	Head	Target
1. Drill Well	4	1	2	
2. Build Pump House	1	2	5	
3. Install Pipe	1	5	7	10Jul85
4. Construct Power Line	1	1	5	07Jul85
5. Excavate	1	1	4	04Jul85
6. Install Pump	1	4	7	
7. Deliver Material	1	1	3	
8. Assemble Tank	1	3	6	
9. Erect Tower	1	6	7	
10. Pour Foundation				
11.				
12.				
13.				
14.				
15.				



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IN DEPTH/RELATIONAL DBMS

The integrity features of the relational model must also be followed closely:

- 1.1 Entity integrity.
- 1.2 Referential integrity.
- 1.3 User-defined integrity.

The integrity features cited in 1.3 are part of the comprehensive data sublanguage. They support the trigger and assertion approach to defining those integrity constraints that are specific to the particular database. By contrast, 1.1 and 1.2 apply to all relational data bases. Examples of these extensions have been published, although not fully implemented, for both SQL and QBE.

A simple rating technique

To be mid-80s fully relational, a DBMS must fully support all 12 of the basic rules, as well as all nine structural, all 18 manipulative and

all three integrity rules of the relational model — a total of 42 features. I use the term "mid-80s" because it is likely that there will be a few more requirements by the nineties.

To provide a simple method of rating any DBMS on its fidelity to the relational model, treat each rule or feature fully supported by that DBMS as contributing one to the overall score (otherwise the contribution is zero). Then double the total score to obtain a percentage fidelity

rating for the system.

If a DBMS were to achieve a total score of 42 out of 42 (and I believe no such DBMS presently exists), add 8 points to that score before doubling it — as a reward for true fidelity. Thus its fidelity percentage would be calculated to be 100.

The resulting fidelity percentage is not highly accurate. In fact, if it falls between 10% and 90%, I would recommend rounding it to the nearest multiple of 10% in order to avoid misrepresenting the accuracy by dis-

playing more than one significant digit.

Evaluation against the model

By today's standards, 46% is a good, but improvable, fidelity percentage. Figure 2 shows the systems DB2, IDMS/R and Datacom/DB evaluated against all 30 features of the relational model. Often the 12 rules are by themselves adequate for comparison purposes. But this more detailed evaluation of the three systems primarily serves expository purposes.

Sometimes users say of a DBMS: "Why should I worry about the degree of its fidelity to the relational model? Surely it is enough for me to know about its fidelity to the ANSI SQL standard."

Unfortunately, the ANSI standard as now proposed is quite weak. It fails to support numerous features that users really need if they are to reap all the advantages of the relational approach.

ANSI's proposed standard for relational systems functions like a convoy, which can proceed only as fast as the slowest ship. The standard is based heavily on that portion of SQL supported by several vendors.

Listing the major differences between ANSI's SQL and, as an example, the SQL implemented in IBM's DB2 shows that ANSI's SQL is even less faithful to the relational model than the vendor's SQL:

- The draft ANSI SQL does not specify catalog tables and does not allow CREATE or GRANT statements to be included in application programs. Instead, it requires a "schema" that specifies an authorization ID and a list of definitions of tables, views and privileges.

- ANSI does not support "dynamic SQL" — SQL statements that are computed at execute time.

- The set of reserved words in ANSI is significantly smaller than that in DB2.

- In ANSI, the "Unique" attribute applies to a column or combination of columns as it should, whereas in DB2 it applies to an index (which it should not).

The ANSI version, therefore, is inadequate as a tool for evaluating DBMS products. The remarks about DB2 apply to certain other vendors' products also.

My view of these ANSI items is as follows.

- Omitting catalog tables was a poor judgment; the catalog needs to be standardized. The ANSI version looks like a survivor of non-dynamic CODASYL.

- Failure to support dynamic SQL was another poor choice. This feature is needed and is used.

- The smaller set of reserved words places vendors with relational DBMS products that go beyond the proposed ANSI standard in a potentially difficult situation. Several vendors find themselves in this category.

- The ANSI treatment of the "Unique" attribute is good in my opinion. An index is treated by ANSI as a purely performance-oriented tool, so there are no semantic consequences of dropping one.

My main criticism of the ANSI Level 1 and Level 2 proposed standard for relational data bases is that inadequate attention is given to some very important areas. For example, the comprehensive, dual-mode data sublanguage capability that SQL



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IN DEPTH/RELATIONAL DBMS

(as implemented) already possesses is underemphasized. The entire range of SQL implementations from the large mainframes down to the micro is not adequately addressed.

Finally, ANSI ought to extend presently supported SQL to a version that fully supports the relational model, including distributed data base. At the very least, ANSI should generate a statement of direction adequate to permit vendors to extend the fidelity of their products without risking incompatibility with some future standard.

Extensions of SQL that provide this support now can be forecast in detail and with some reliability. Any standard adopted now should not make these extensions impossible or even difficult in the future.

Three buying factors

Any buyer confronted with the decision of which DBMS to acquire should weigh three factors heavily. The first factor is the buyer's performance requirements, often expressed in terms of the number of transactions that must be executed per second. The average complexity of each transaction is also an important consideration. Only if the performance requirements are extremely severe should buyers rule out present relational DBMS products on this basis. Even then buyers should design performance tests of their own, rather than rely on vendor-designed tests or vendor-declared strategies.

The second factor is reduced costs for developing new data bases and new application programs. Relational DBMS provide significant reduction in these costs, when compared with either the CODASYL or hierarchic approaches. Fourth-generation languages are no substitute, although they may provide some additional productivity.

The third factor is protecting future investments in application programs by acquiring a DBMS with a solid theoretical foundation and reliable support for high productivity and distributability. In every case, a relational DBMS wins on factors two and three. In many cases, it can win on factor one also — in spite of all the myths about performance.

Then the question arises: Which relational DBMS? The system chosen should not only be a DBMS with a good percentage of fidelity to the

**At the very least,
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without risking
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with some future
standard.**

relational model, but should be extensible at some future time. Ideally a good DBMS will be extended soon to provide 100% support without logically impairing the customer's investment in application programs.

Buyers should be cautious with vendors that make strong claims — claiming the system is "post relational" (especially when no definition for this term is supplied), or claiming that the DBMS choice has no importance. In fact, your choice of DBMS now may well determine how readily your organization adapts to changes in the future.

It is time vendors realize that all the features of the relational model are interrelated and interdependent. Missing features leave large gaps in the integrity control and usability of a DBMS implementation.

There is nothing on the horizon right now that looks strong enough and practical enough to replace the relational approach. Moreover, because the relational approach relies on such a solid theoretical foundation, its lifetime will last much longer than the CODASYL, hierarchic or tabular approaches.

I also believe that it will be much easier for relational DBMS users to convert to whatever future approach appears to be superior, for two reasons. The relational approach insists on all information being recorded explicitly. Moreover, the approach has a close tie to first-order predicate logic — a logic on which most of mathematics is based, hence a logic which can be expected to have strength, endurance and many applications.

Evaluation against the relational model (by DBMS)

	DB2	IDMS/R	Datacom/DB
Relations	Yes	No	No
Base tables	Yes	Yes	Yes
View tables	Yes	No	No
Query tables	Yes	No	Yes
Snapshot tables	No	No	No
Attributes	Yes	Yes	Yes
Domains	No	No	No
Primary keys	Partial	No	No
Foreign keys	No	No	No
Theta select	Yes	Yes	Yes
Project	Yes	Yes	Yes
Theta join	Yes	Partial	No
Outer theta join	No	No	No
Union	Yes	No	No
Outer union	No	No	No
Intersection	Yes	No	No
Set difference	Yes	No	No
Division	Yes	No	No
Relational assignment	Yes	No	No
Maybe theta select	Yes	No	No
Maybe theta join	Yes	No	No
Maybe outer theta join	No	No	No
Maybe divide	Yes	No	No
S/O theta select	No	No	No
S/O theta join	No	No	No
S/O outer theta join	No	No	No
S/O divide	No	No	No
Entity integrity	Partial	No	No
Referential integrity	No	Partial	No
User-defined integrity	Partial	No	No
Total score against relational model (1 for full support, 0 otherwise)	16	4	5
Total score on 12 rules	7	0	0
Grand total score	23	4	5
% fidelity	46	8	10

Figure 2

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IN DEPTH

Accounting for computers



1. Are we spending the right amount on computers?
2. Are we spending on the right things?
3. Why are we spending so much?

When management asks, can you answer?

By Kenneth Rau

If you listen closely, you will find the three questions most often asked by senior managers involved with computers are: Are we spending the right amount on computers? Are we spending it on the right things? Why are we spending so much?

Too often DP managers retreat from these forthright management questions into the safety of hardware and software specifications. It is as if we considered the analytical tools of the accounting profession distasteful and inapplicable to DP.

But such is not the case. Financial analysis, ratios and funding models are powerful tools in the DP manager's hands. Together, they can be used to shed light on many of the mysteries that surround computers in the minds of senior managers today.

Establishing "the right amount" to spend is no mean feat. Over the last twenty years, one rule-of-thumb has surfaced as an industry norm: the 1% rule. This principle holds that on the average, companies can expect to spend 1% of the total corporate revenues on data processing.

Now just because other companies spend this amount doesn't mean that's what your company should spend. It doesn't even mean that if this is what you are spending then you're spending the right amount, but it is a starting point. Just the

exercise of comparing a company's spending with this benchmark can be useful as it often raises subordinate questions: How much are we spending on computers? How much spending on computers is going on outside of the DP department? How should we capture and account for expenditures on such items as personal computers, personal computer software, service bureaus, contractors and so on.

Effective use of the 1% rule concentrates on explaining observed variations. Variations from the industry benchmark divide into two types: variations caused by circumstances and variations caused by strategy.

Circumstances frequently associated with spending less than 1% of revenue on data processing typically apply to the following:

- Heavy, capital-intensive industries such as chemicals, metals or oils.
- Mature industries such as automobiles, textiles or machine tools.
- Noncompetitive markets such as agriculture or utilities.
- Cottage industries including hospitals, real estate and some retail trades.
- Start-up companies.
- Very small firms.

Conversely, companies in the service and high-tech industries frequently spend more than 1% of revenue on DP. Competitive consumer environments, particularly those in which DP is a service offering (banking, insurance, airlines), also tend to spend more than the industry average.

Surprisingly, the size of the firm within its

industry seems to have only a slight, occasional effect on variations from the spending rule. Smaller firms can get away with spending less, but only for a while.

Spending the right amount

Management strategies, deliberate or de facto, can be more influential than circumstances in affecting spending patterns. Companies that view themselves as leading edge, entrepreneurial or aggressive tend to spend more than circumstances would suggest. Conversely, conservative, methodical companies often spend less. Senior managers, and in particular chief executive officers, who articulate a strategy of spending more (or less) on DP and then follow up with actions can have the most dramatic effect of all on causing variations from the norm.

By helping senior managers understand how much they are spending on data processing, how much they are spending compared with others and why their spending varies, DP managers can relieve their concerns about whether they are spending the right amount. Alternatively, where such analyses produce unexpected results, underlying causal strategies can be exposed, questioned and altered where appropriate.

Financial analysis tools bear interesting and useful fruit when applied to the second key management question: Are we spending on the right things? Determining how the overall investment in DP is allocated among the various options reveals additional implicit strategies and may suggest ways to improve performance.

Kenneth Rau is president of The Winchester Consulting Group. The Woburn, Mass. group acts as management consultant to MIS organizations and performs market research for vendors. Rau is a frequent lecturer on data resource management and micro-to-mainframe links.

IN DEPTH/FINANCIAL ANALYSIS FOR DP

Spending on DP can be viewed in at least four ways: 1) by object of expense, that is, by general ledger line item, 2) by application system, 3) by user area and 4) by activity.

Spending on the right things

The most common way to report DP spending is by object of expense. Industry averages suggest 40% of DP expense today is personnel related, 33% is hardware related, 13% is software related and 4% is data communications related. The remaining 10% includes supplies, occupancy, allocations and miscellany. By comparing the planned or actual DP expenditures to such averages, managers can determine whether the firm is spending DP dollars on "the right things."

The principle service provided by DP is processing transactions against application systems such as payroll,

order entry, funds transfer or material requirements planning (MRP). Recasting the DP dollars by the amount spent per application yields a useful analysis. Its analogy in cost accounting is product costing.

Most medium and larger computers today use system software that contains programs to report on system resources consumed by application, so many companies perform this type of analysis. By dividing total DP operating costs by the per-

cent of resources consumed by each application, DP can produce a crude analysis of cost by application system. Cost per application transaction can also be reported in this way.

By shining a spotlight on the absolute cost of producing an invoice or paycheck, managers can learn and infer a great deal about whether DP dollars are being spent on the right things. A comparison of transaction costs can lead to recommendations for system replacement or even dis-

continuation. Noting trends in application transaction costs over time and changes resulting from new system acquisitions (hardware or software) provides a high-level measure of whether promised benefits and cost improvements were realized.

Accounting by user area refers to tracking functional areas within the company (accounting, marketing, manufacturing and so on), geographic divisions or businesses. Comparisons of the percent of DP dollars spent by user area with the percent of total corporate dollars spent by user area affords a useful analysis. Management can use the results to formulate specific strategies for aligning DP spending patterns with overall spending strategies.

To answer the question: "Are we spending our DP dollars on the right things?" DP can classify expenditures by activities performed. DP functions typically perform four activities:

- Production — running the existing applications on the computer.
- Maintenance — keeping systems in good repair and capable of satisfying user requirements.
- Development — designing and installing new or replacement systems for the computer.
- Administration — managing, controlling and planning for DP.

Figure 1 depicts industry average spending for these four activities as a percent of total DP spending. The chart also shows expected ratios between key activities.

The suggested ratio of development to maintenance costs of 1:1 is appropriate for a stabilized DP function. This ratio favors development in newly established functions where maintenance is not yet a major expense. Whenever this ratio favors maintenance, managers should suspect underfunding of DP. The slanted ratio suggests that old systems are not being replaced and that the organization is milking its installed base of application systems. Left uncorrected, the imbalance puts the organization at risk of losing efficiency and competitive edge.

The ratio between the cost of

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Average expenditures (by activity)

% of Total Ratio

Development
0-20%

Maintenance
10%-20%

Production
40%-60%

Administration
5%-20%

1:1

1:2½

Figure 1

IN DEPTH/FINANCIAL ANALYSIS FOR DP

computer operation (production) and the cost of system maintenance should be approximately 2½:1. Much higher ratios suggest application systems are inadequately maintained. Since most application systems go through a "burn-in" period following installation, failure to maintain these systems adequately not only implies deterioration, but can stretch out the time spent on this frustrating trial period. Worse, lack of maintenance can leave application systems in a permanent state of ineffectiveness.

Production-to-maintenance ratios of less than 2½:1 are more common. The need to maintain old, poorly designed and crumbling application systems forces this emphasis. If managers can identify a few culprit application systems, they can recommend their replacement, justifying costs on the basis of improved efficiency. There are strategies for dealing with an entire inventory of senile applications, which can be used alone or in combinations: restricting maintenance/enhancement requests, funding preventative maintenance projects, developing plans for system replacement and accelerating system development activities.

Analysis of DP expenditures by object of expense, user area, application and activity helps managers identify abnormalities and inefficiencies. Corrective action improves DP and organizational performance by ensuring DP resources are expended on "the right things."

Data processing can be viewed as a business within a business. The

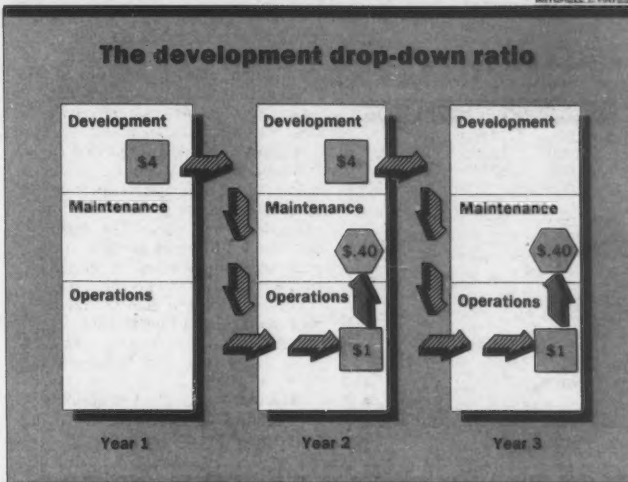


Figure 2

factory of DP consists of the operations activity. Maintenance activity keeps the factory running and development activity expands, refurbishes and modernizes it. The ratios of Figure 1 define relationships between the activities that can be used to model the function.

Why are we spending so much?

One additional ratio is needed for sound modeling: the relationship between the development and operations activities. It is this ratio that drives the model. To understand this relationship is to understand why

we are spending so much on DP — why that \$75,000 capital appropriation of four years ago has grown into an on-going expenditure of a quarter of a million dollars per year.

Spending money on development is analogous to deciding to invest in a new manufacturing plan, introduce a new product or acquire a new business. Development dollars should be viewed as an investment with associated on-going costs: operation and maintenance. In well-run DP development activities, \$4 spent in development result in \$1 of additional operating cost in each succeeding pe-

riod throughout the system's useful life (Fig 2).

Adding this "development drop-down" notion to the previously discussed ratio between operations and maintenance provides the basic ingredients for a deterministic model of the data processing function. In narrative form, the model states:

"A \$4 investment in new systems development in year one will provide a \$1 increase in production (operations) cost in year two and beyond. This, in turn, will cause a permanent 40-cent increase in maintenance activity, or \$1 divided by two and a half."

Presented to senior management in this way, the model clearly implies a continuing investment in the development activity — growth in total DP expenditures is locked in. In addition to answering the question: "Why are we spending so much?" the model provides a vehicle for managing DP growth in a manner consistent with corporate strategies and objectives.

The organization interested in developing its own unique model must not only identify current expenditures for each DP activity but also research what the historic ratios of the firm have been. Managers should examine the ratios between development and operation and between operations and maintenance. With use and experience, the organization's unique model can be enhanced and expanded with other factors:

- Growth in transaction volume leading to increased DP operating costs.



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Telex? Strong enough to have earned the confidence of a market that demands stability, dependability and innovation. That's why more and more companies are trusting Telex to be their #1 3270 supplier.

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IN DEPTH/FINANCIAL ANALYSIS FOR DP

DP funding — standard model

	1985	1986	1987	1988	1989
Development	\$100,000	\$120,000	\$144,000	\$172,800	\$207,360
Maintenance	100,000	120,000	144,000	172,800	207,360
Operations	250,000	300,000	360,000	432,000	518,400
Administration	12,500	15,000	18,000	21,600	25,920
Total DP costs	\$462,500	\$555,000	\$666,000	\$799,200	\$959,040

Assumptions: • Development to Operations ratio = 4:1
 • Operations to Maintenance ratio = 2-1/2:1
 • Operations to Administration ratio = 20:1
 • Operations Transaction Growth = 10%
 • Development to Maintenance = 1:1

Result: Compound growth rate of 20% per year
 Development funds available = \$744,160 over five years

Figure 3

■ The relationship of DP administrative costs to total expenses.

■ The effect on development drop-down ratio of prototype development, purchased software, data base management system, fourth-generation languages, and so on.

Figure 3 shows a simplified DP funding model as might be produced using any of the popular spreadsheet programs and the generic relationships described above. The model can be used to set strategies and address abnormalities. In combination with a DP systems plan, it can suggest answers to many other senior management questions:

■ How long will it take us to complete the system plan? What will be the final cost?

■ What is the effect of capping DP spending at its present level? Of capping DP head count?

■ How many DP personnel are required to complete the systems plan in five years? What will be the annual DP expenditure in year five?

Getting started

An organization interested in performing the analyses described above should begin by defining and establishing a data base of financial information on the DP function. It may be possible to use the corporate general ledger system for this purpose. Alternatively, a stand-alone system can be built on a personal computer with the help of a data base management package.

The organization should choose a system that allows DP expense (and revenue) items to be encoded and summaries to be reported in many different ways. In addition to the "object of expense" classifications (equipment, supplies, salaries and so on), at a minimum, the system should capture associated attributes including:

■ Project/product — development and maintenance activities associated with a specific project; operational expenses with a product, that is, an application system.

■ User area — functional area, geographic area and/or strategic business unit.

■ Activity type — development, maintenance, production or administration.

”

The ratio between development and operations activities drives the model. To understand this relationship is to understand why we spend so much on DP.

Historic data should be maintained for comparative purposes, for establishing organization ratios, for trend analysis and modeling.

All of the standard DP financial analyses described in this article are made possible by creating such a data base. These analyses should eventually become part of the periodic DP performance reporting program under the umbrella of "performance management" (CW, August 20, 1984). More important, the review of these standard generic DP financial reports with management will almost certainly lead to requests for other breakouts, extracts and combinations of this data, tailored to the needs of the organization. A strong data base built around the guidelines above will afford these auxiliary combinations.

Financial analysis, ratios and modeling can make DP more fathomable to senior management. Far from being inapplicable to the DP function, these analyses can be a powerful tool for DP management and provide common ground for interdepartmental communications. Armed with DP reports presented in familiar form — as a financial investment decision — senior managers will, at long last, participate effectively in setting directions and formulating strategies for DP.



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Want better speed and memory on your PC or XT without buying an AT? You've got it!

Phoenix's new Pfaster™286 co-processor board turns your PC or XT into a high-speed engine 60 percent faster than an AT. Three times faster than an XT. It even supports PCs with third-party hard disks. But that's only the beginning.

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If you really didn't want an AT in the first place, just what it could do for you, call or write: Phoenix Computer Products Corp., 320 Norwood Park South, Norwood, MA 02062; (800) 344-7200. In Massachusetts, 617-762-5030.

Programmers' Pfantasies™ by

Phoenix

XT and AT are trademarks of International Business Machines Corporation. Pfaster286 and Programmers' Pfantasies are trademarks of Phoenix Computer Products Corporation. For the Ferrari aficionado: yes, we know this is a rear engine car. We are showing the addition of a second engine to symbolize how Pfaster can be added to your PC or XT to increase performance.

NEW PRODUCTS

Cyber-Epic Release 2 launched

Control Data Corp. of Minneapolis has introduced Release 2 of its Cyber-Epic exploration and production interpretation system, an integrated set of applications and interpretation tools for oil and gas exploration, analysis and reservoir engineering.

Cyber-Epic Release 2 integrates every step in the interpretation of data for exploration and reservoir engineering using enhanced tools for two- and three-dimensional seismic modeling as well as advanced capabilities in reservoir modeling and simulation. It offers new software applications and capabilities including Sierra Geophysics' set of 10 exploration applications providing 2- and 3-D modeling, Geoquest International's AIMS III for 2-D modeling and hydrocarbon processing and the VIP-Executive from J. S. Nolen and Associates, for advanced reservoir simulation, modeling and engineering.

Other software packages offered in Release 2 are Terrasciences, Inc.'s Terralog for analyzing data gathered in drilling holes and generating graphics output; CPS-1 from Radian Corp. for processing displays of the surface; CDC's Loglib data base application; and Comex, an integrated system of conversational programs.

Cyber-Epic Release 2 is available on CDC's Cyber 180 computer series, ranging from the Cyber 180/810 model to the Cyber 180/990. It supports the Landmark System Corp. Graphics Interpretation Workstation via an Ethernet link. It also supports the interactive Tektronix, Inc. 4115 High Resolution Graphics Station emulation on the Landmark system, and users can utilize the Landmark 3-D interpretation software directly on data processed on the Cyber-Epic system.

Pricing depends on the software and hardware configurations used. A typical 810 system configuration costs about \$250,000. Prices for the software applications range from \$10,000 for Loglib to \$190,000 for the VIP-Executive.

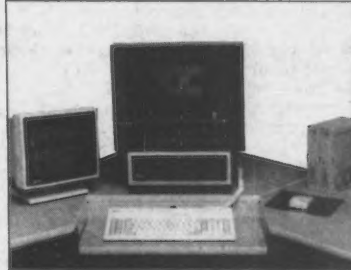
CAE workstation debuts

Chancellor Computer tool designs circuit boards

Chancellor Computer Corp. of Mountain View, Calif., has introduced a stand-alone computer-assisted engineering (CAE) workstation that, running with the AT&T 6300 personal computer, is used for integrated circuit and printed-circuit board design.

The Chancellor STL-TWO was designed to perform schematic capture and physical layout in a single graphics editor. It has a layering capacity of up to 50 layers, a menu-driven two-letter mnemonic command structure and comprehensive libraries of up to 5,400 parts.

According to the vendor, the STL-TWO has 640K bytes of random-access memory (RAM), a 10M-byte hard disk, a 360K-byte floppy disk and Intel Corp. 8-MHz 8086 and 8087 math coprocessors. It offers a high-resolution graphics subsystem complete with a 19-in. monitor, 1,024-by-768-pixel resolution, a choice of 16 colors, a



Chancellor Computer's stand-alone CAE workstation

NEC Corp. 7220 chip to increase speed and performance and 512K bytes of dedicated RAM.

The STL-TWO includes graphics features such as continuous pan and zoom capabilities, five different view and windowing commands and eight drawing and digitizing modes.

The STL-TWO CAE workstation is priced at \$14,995.

Memorex rolls out printer

Memorex Corp. of Santa Clara, Calif., has released a multifunction matrix printer for the IBM System/34, 36 and 38.

The Model 2024 attaches to an IBM 5251 Model 2 or Model 12 controller, to an IBM 5294 controller or directly to the IBM host. It prints near letter quality at 80 char./sec. and draft quality at 350 char./sec. The printer will handle a variety of papers, including fanfold, up to 16-in. wide and up to six parts thick.

The 2024 will print in 10, 12 or 15 char./in. spacing or with proportional spacing. Text can be printed in either of the two standard fonts, in any combination of elongated, boldface or italics.

The printer costs \$5,395 in single quantities.

Stand-alone units bundled

General Business Technology, Inc. of Irvine, Calif., has announced that it is packaging its IBM System/34-, 36- and 38-compatible matrix printer and CAT Display Station as one system.

Although still available as stand-alone units, the 5222DP Matrix Printer and 7700 CAT Display Station can now be linked together by General Business Technology's Printer Controller module. The printer controller connects the printer directly to the 7700 CAT terminal.

The 5222DP produces data processing-quality output at 200 char./sec. and near-letter-quality at 50 char./sec. The 7700 CAT station has a 12-in. by 12-in. footprint, a 60-degree swivel and a 20-degree tilt. The package costs \$3,425.

Data General introduces four-member modem family

Data General Corp. has announced the Model 5091 family of modems for use with any DG system.

The Model 5091 family consists of four modems, each available as a stand-alone unit or as rack-mounted card modules. All four are registered with the Federal Communications Commission for direct connection to the U.S. telephone network. Each modem supports full-duplex, half-duplex, synchronous or asynchronous transmission.

The first modem in the family transmits data at speeds from 300 to 1,200 bit/sec. It is said to offer compatibility with AT&T 212/103 modems.

A second modem supports 2,400 bit/sec. transmission with a fallback

rate of 1,200 bit/sec. It supports AT&T 212- and CCITT V.22 standards.

Both of these modems are said to offer manual-dial, autodial and auto answer capabilities. The autodial allows users to store up to 20 telephone numbers.

The third modem supports 4.8K bit/sec. transmission with a fallback rate of 2,400 bit/sec. It offers compatibility with CCITT V.27 standards.

The fourth modem transmits data at speeds of up to 9.6K bit/sec. with fallback rates of 7.2K bit/sec. and 4.8K bit/sec. It supports CCITT V.29 standards.

Prices for the modems range from \$700 to \$1,000 depending upon the model.

APL programs available for IBM AT/370, XT/370

IBM has announced that APL2 and VS APL are now available for the IBM Personal Computer AT/370 and the IBM Personal Computer XT/370.

These programs were designed to enhance the compatibility of the IBM Personal Computer/370 workstation environment with the host Virtual Machine/System Product (VM/SP) and VM/High Performance Option environments.

The Personal Computer AT/370 and the Personal Computer XT/370 can now execute the same APL programs as the 370 host. Data may be entered interactively, the program executed and the results reviewed on the desktop workstation. This enables users at remote locations to make use of the System/370 APL pro-

cessing capability, as well as providing security and confidentiality of data for the programs executed on the Personal Computer workstations.

A host is not necessary for program execution although access to a VM System/370 host is required for downloading the programs. Only line-mode operation of VS APL and APL2 is supported on the Personal Computer workstation. The APL character set is not supported on the printer or the display.

The monthly charge for either APL2 or VS APL is \$49. The one-time charge for either program is \$735. The one-time charge includes any future enhancements or releases made available under the same program number.

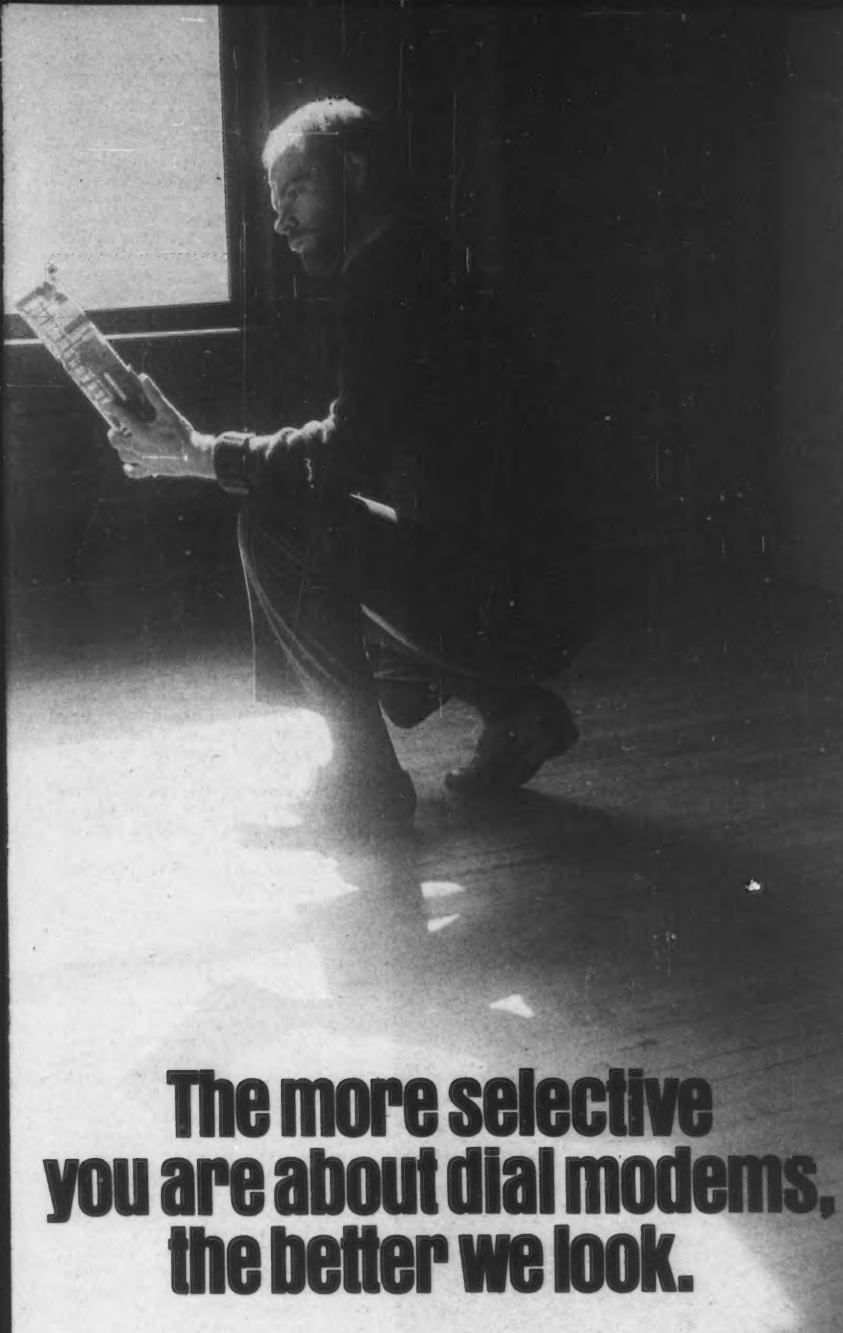
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*McGraw Hill's "Data Communications" magazine rated us as having the best technology and price/performance. Motorola and  are trademarks of Motorola, Inc. Codex is a registered trademark of Codex Corporation. © 1985 Codex Corporation.

NEW PRODUCTS

Continued from page 66

systems calls, physical memory access, arithmetic primitives, ability to link and unlink files or pipes and concurrent communications capability among multiple kernels.

Unilisp is available on Digital Equipment Corp. DEC Pro 300 series and Microvax, Intel Corp. 310, AT&T 3B2 and IBM Personal Computer AT microcomputers.

Prices range from \$750 for use on desktop systems to \$1,050 for multiuser workstations.

R/I Group, 7623 Leviston St., El Cerrito, Calif. 94530.

Training

Innovative Software Solutions, Inc. has unwrapped Teachme/3000, a modular interactive package that runs on and trains users about Hew-

lett-Packard Co. 3000 systems.

Teachme/3000 consists of four modules. An Introduction to the HP-3000 acquaints users with the system in general. An Introduction to TDP/3000 trains new employees to use HP's text and document processor.

There are two more technically oriented modules designed for programmers and system developers. Image/3000: Principles and Utilities reportedly delves into HP's data base management system, while Cobol to Cobol II: Conversion and Features is said to discuss how to convert to and use Cobol II.

The four modules and a driver cost \$3,200. The driver alone sells for \$1,000; modules cost \$750 each if purchased separately, according to the vendor.

Innovative Software Solutions, 10705 Colton St., Fairfax, Va. 22032.

MICROCOMPUTERS

Software

Pallas International Corp. has announced a capacity planning package called **Disk Model** designed to evaluate the performance of DASD on the IBM Personal Computer and other PC-DOS microcomputers.

Disk Model is said to be able to predict the performance of regular DASD and cache disk controllers. It is menu driven and offers built-in parameters for DASD and disk cache types, which can be overridden. It is dual ported and offers dynamic path selection.

Additionally, the product has a split-screen mode that can be used to compare results of two model runs, and results can be transferred to

word processors and spreadsheets such as Lotus Development Corp.'s 1-2-3. Parametric model definition is possible using symbolic variables.

There are two versions of Disk Model available. Both the software floating-point version and the version requiring a floating-point coprocessor cost \$750. They can be purchased together for \$1,000.

Pallas International, 1763 Valhalla Court, San Jose, Calif. 95132.

Softdesign, Inc. has announced **Timebase 1.6**, an updated version of its office management system for Apple Computer, Inc.'s Macintosh.

Timebase 1.6 combines time management, data base management, deadline management and simple word processing on one disk.

Features of Version 1.6 include multiuser capabilities, viewing of unlimited multiple schedules in a single screen, schedule planning, customized time reporting, voice-synthesized reminders and alarms, mailing labels, tracking of expense accounts and credit cards and compatibility with Apple's Laserwriter laser jet printer.

The cost of Timebase 1.6 is \$149.95. To upgrade from Version 1.01 to Version 1.6 costs \$10, the vendor said.

Softdesign, 14145 S.W. 142 Ave., Miami, Fla. 33186.

Systems

Dicomed Corp. is offering **ProducerXP**, a graphics workstation.

ProducerXP is based on an 8-MHz Intel Corp. 8086 multibus CPU with an 8087 numeric coprocessor. It offers 46M-byte formatted hard-disk storage plus a 10M-byte removable cartridge.

The workstation is said to provide multiple slide operation sequences, word processor-style text editing and an image storage system with off-line communications. Each image can contain up to 124 colors from a palette of 16.7 million.

A local-area network option, XPlan, allows users to configure multiple workstations for task sharing and graphics merging.

An optional application software package, XPmanager, tracks production and performs cost accounting by image, job or client, according to the vendor.

Other options include a 20-font graphics arts package, XPfonts, and XPchart, software that automatically creates charts and graphs. A spelling checker and dictionary are also available.

Priced at \$79,900, the standard ProducerXP includes a 10M-byte removable hard disk drive, 55M-byte hard disk, 13-in. 640- by 480-pixel color display, 16-bit CPU with 1M-byte random-access memory, integrated digitizing tablet, keyboard, five-way adjustable chair, 1,600-image library, system software, two 10M-byte disk packs, 1,200 bit/sec. communications and a user manual, the vendor said.

ProducerXP options cost \$5,000 for XPmanager and \$55,000 for XPfonts. Other option prices are \$5,000 for XPchart, \$500 for XPspelling Checker and \$500 for XPdictionary.

Dicomed, P.O. Box 246, 12000 Portland Ave. S., Minneapolis, Minn. 55440.

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NEW PRODUCTS

Communications

Decision Graphics, Inc. has developed the **PC File Transfer Program**, a menu-driven file transfer and dialogue handler package.

Using predefined dialogues, the product reportedly enables IBM Personal Computers and compatibles to communicate with remote computers to exchange data files or execute system commands and user programs.

It can control interactive programs, check for specific prompts and supply the correct response, according to the vendor. Other functions of the system include the ability to transfer ASCII files between the IBM micro and a Digital Equipment Corp. PDP-11 or VAX computer and specify user-defined dialogues for different computer systems.

The program operates with a user-defined or supplied dialogue file that includes user messages, prompts, object system commands and file transfer commands.

The package includes commands that clear the Personal Computer screen, write a message to a Personal Computer screen position, write a prompt to a position on the Personal Computer screen and read the user response, send a command to the object system and get a character from the object system.

Priced at \$75, the product requires IBM PC-DOS 2 or higher, an asynchronous RS-232 communications port and an ASCII terminal port.

Decision Graphics, Suite 1622, 555 Sparkman Drive, Huntsville, Ala. 35816.

Gateway Communications, Inc. has announced **G/X25 Net**, a multiuser version of its **G/X25 PC** communications subsystem for the IBM Personal Computer, Personal Computer XT and AT.

The product reportedly allows micros attached to Gateway's **G/Net** local-area network to access public data networks such as McDonnell Douglas Network Systems, Inc.'s Tymnet and GTE Telenet Communications Corp.'s Telenet.

G/X25 Net hardware consists of Gateway's **PC Wide-Area Network Interface Module** expansion card, based on the Zilog, Inc. Z80B chip with 64K bytes of memory. Communications speeds of up to 19.2K bit/sec. are supported on up to two synchronous ports.

The software consists of modules handling X.25 data packetization and message accumulation, session support and flow control and an IBM PC-DOS-compatible communications application providing TTY, Digital Equipment Corp. VT100 and Televideo Systems, Inc. 950 terminal emulation.

G/X25 Net can be used as a network-to-network bridge over an X.25 link or as a network-to-mainframe link to an X.25 packet-switched host computer.

In each case, the gateway micro retains its full PC-DOS-based workstation capability, according to the vendor.

The multiuser hardware/software subsystem costs \$2,495.

Gateway Communications, 16782 Red Hill Ave., Irvine, Calif. 92714.

Storage

Tallgrass Technologies Corp. has announced that its complete line of mass storage **Hardfile** and **cartridge tape backup subsystems** are now compatible with IBM PC Net, Novell, Inc.'s Netware series and 3COM Corp.'s Etherseries networks.

A Tallgrass mass storage system allows users to choose 25M, 35M, 50M, 80M or 160M bytes of hard-disk storage with 60M bytes of integral cartridge tape backup. It features Tallgrass' personal computer tape format.

Tallgrass Technologies, 11100 W. 82nd St., Overland Park, Kan. 66214.

COMMUNICATIONS

Controllers

International Data Sciences, Inc. has announced the **IDS Bullet Model 6400 Data Compressor**, a data compressor designed for use with asynchronous, full-duplex, two-wire dial-up lines.

The product is said to allow data throughput up to 19.2K bit/sec. It incorporates a proprietary error-correction algorithm that reportedly guarantees 100% error-free data transmission.

The **IDS Bullet** has three modes of operation. The first, in which the **Bullet** is effectively transparent to the system, is used for data rate conversion only, not for data compression.

The second mode is identical to the

first except that error correction is performed on incoming data.

The third mode adds the adaptive data compression feature, which increases data throughput four times more than the previous rate of data throughput.

All three modes are compatible with autodial, origination type and leased-line modems.

The **IDS Bullet** costs \$995.

IDS, 7 Wellington Road, Lincoln, R.I. 02865.

Voice/data communications

Automatic route selection and simultaneous voice/data transmission capabilities have been added to **AT&T Information System's Merlin Communications System Feature Module 4**.

Automatic route selection places telephone calls over the least costly line. Users set up tables so the system automatically sends calls over foreign exchange, WATS or other lines.

Data terminals can be connected to the product through an outlet on the jack in a Merlin telephone set. Data can be transmitted over the same line as voice.

Another addition permits any station in a system to be programmed by an administrative terminal. A direct line pickup feature enables a user to answer any line that is ringing, parked or on hold in the system.

The product costs \$1,450.

AT&T Information Systems, 100 Southgate Pkwy., Morristown, N.J. 07920.

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DATA BASE FAT.

HOW TO AVOID IT, FROM THE LEADER
IN ON-LINE TRANSACTION PROCESSING.

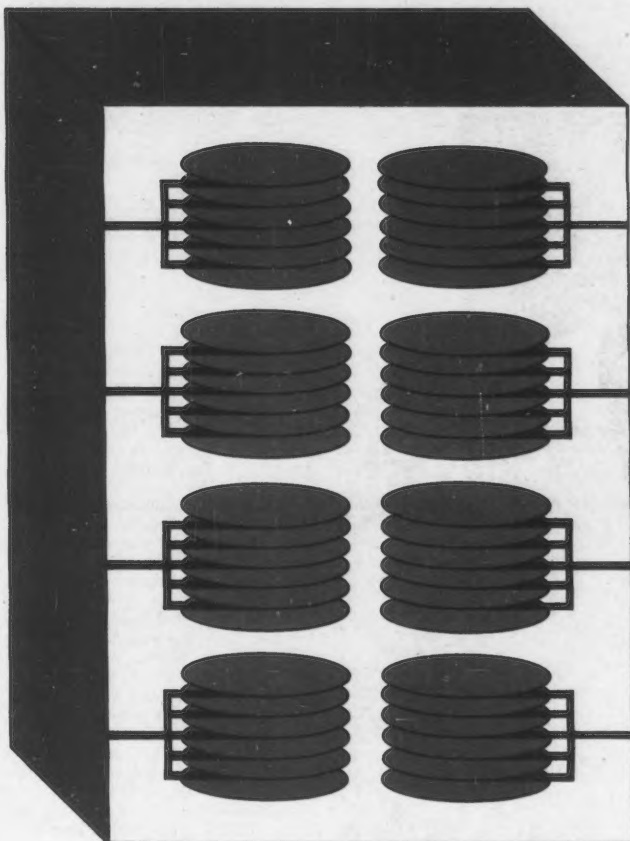
WHAT DATA BASE FAT IS.

It's a waste of time and space—the time it takes to access data and the space required for the storage. It's a hardware problem and a software problem and Tandem has solved them both.

NEW NON-FAT HARDWARE.

Introducing a new disc drive product called the Tandem V8.

The data base that would normally be stored on one large, conventional disc has been split up over eight small, high-density discs.



NEW TANDEM V8.

8 disc drives, 8 actuators in one cabinet.

Instead of one actuator handling I/O requests sequentially, eight actuators can now work simultaneously. No disc space goes unused.

The Tandem V8 gives you high throughput, stores 1.3 gigabytes of data, yet remarkably takes up only six square feet of floor space.

Maintenance is easy, too. Each disc drive can be removed and replaced in a few minutes. And the Tandem V8 can stay on line even while it's being serviced.

NEW NON-FAT SOFTWARE.

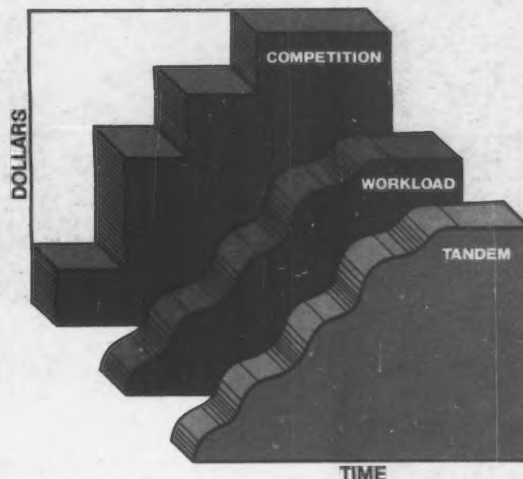
We've developed new data base software that allows our relational data base to operate 50% to 100% faster on the same hardware. That means you can boost your throughput without buying new hardware. Massive amounts of data can be made easily and instantly available to hundreds of users, even if they're geographically distributed over a worldwide network.



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 **TANDEM COMPUTERS**

NEW PRODUCTS

Protocol converters

Dynatech Packet Technology, Inc. (Dynapac) has announced **Proto-PAD X.25**, a product that is an extension of its packet assembler/disassembler family for terminals, computers and hosts using synchronous protocols.

The product is a multiprocessor stand-alone or rack-mounted unit designed for use with IBM 3270 Binary Synchronous Communications (BSC)-compatible equipment. The unit allows up to eight cluster controllers of the 3270-type to connect to a host system with the IBM 3270 BSC protocol.

It has one packet-switched network trunk and one synchronous port that operates in the multidrop mode to support multiple cluster controllers. Call setup is via an autocal

system or by entry at the user terminal.

The Proto-PAD X.25 costs \$2,610. Dynapac, 6464 General Green Way, Alexandria, Va. 22312.

Software

Autosoft, Inc. unwrapped **Modemmail**, a communications program for Digital Research, Inc. CP/M-based microcomputers that offers electronic bulletin board and mail modules.

The **Modemmail** electronic mail network ties together microcomputers to forward, reply to, copy or print mail messages automatically. The network chooses the lowest cost path.

Modemmail enables a computer to act as a gateway between a time-sharing service or a commercial electronic mail service and a Modemmail

network or another time-sharing service.

Security options include the ability to encrypt mail messages and restrict user access to areas of the system where confidential information resides.

System requirements are CP/M 2.2, 64K bytes of memory, at least one disk drive, at least 180K bytes of disk space and the ability to access a modem.

Priced at \$249, the package includes the Modemmail program; a set of Modemmail command files for operating and processing bulletin boards, exchanging electronic mail and accessing commercial time-sharing systems; a customization program; and the user manual, according to the vendor.

Autosoft, 166 Santa Clara Ave., Oakland, Calif. 94610.

Multiplexers/modems

Data Race, Inc. has announced the **Remote Access Computer Extension (RACE)**, an asynchronous dial-up modem that operates at speeds up to 19.2K bit/sec.

The modem provides automatic dialing, operates over two-wire leased lines as well as over ordinary phone lines and can handle either tone or rotary dialing. RACE data rates are selectable to match terminal or computer port rates from 1,200 bit/sec. to 19.2K bit/sec.

RACE contains a microprocessor that provides Cyclical Redundancy Check 16 automatic error correction. It also contains an AT&T Bell Laboratories 103-compatible modem that automatically changes terminal speed settings so users can access public data base services.

RACE employs data stream compression techniques so that it is possible to rewrite a 24-line, 80-column screen in less than 2 seconds.

RACE is available in two versions. RACE I, a single-channel, full-duplex modem, costs \$1,995. RACE II includes a second independent printer channel allowing terminal output and printer output simultaneously over the same dial-up connection. RACE II costs \$2495.

Data Race, 5839 Sebastian Place, San Antonio, Texas 78249.

SYSTEMS AND PERIPHERALS

Terminals

Two display stations, called the **8180** and **8178**, designed to emulate IBM 3270 and Digital Equipment Corp. VT220 environments, are available from **Datastream Communications, Inc.**

The display stations with 14-in. monitors are designed for protocol conversion and gateway applications that access 3270 applications through RS-232C connections.

The stations are IBM 3178- and 3180-compatible in keyboard layout and screen formatting and can operate in minicomputer applications as VT220-compatible terminals.

Full support is said to be provided for the 3270 status line that includes IBM-style ideograms plus a row and column indicator. The 8180 screen supports 3278 Models 2, 3, 4 and 5 screen sizes along with such VT220 functions as compose-character features, function keys and the capability to operate in VT100 and VT52 modes.

The 8178 also supports VT220 functions and the 3278 Model 2 screen, according to a company spokesman.

In 3270 mode, both stations' keyboards offer 24 unshifted programmer function keys and an 18-key pad. Keyboards can be dynamically reconfigured for VT220 emulation.

Prices are \$995 for the 8178 and \$1,850 for the 8180.

Datastream Communications, 2520 Mission College Blvd., Santa Clara, Calif. 95050.

Printers/Plotters

Tempest Technologies, Inc. has announced the **DWP5155Q** and **DWP5155SQ**, daisywheel printers that are accredited by the U.S. government's Tempest security program.

Continued on page 78



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NEW PRODUCTS

Continued from page 76

Both printers are versions of the company's current DWP5155 printer that runs at speeds of 45 char./sec. in letter-quality mode. They are for use with micros and small minis, the vendor said.

The DWP5155Q supports single-bin, dual-bin and dual-bin with envelope sheet feeders and a bidirectional tractor feed.

The DWP5155SQ is a quieter version of the same printer, according to the vendor. It is said to operate at less than 55-db noise levels. It supports single- and dual-bin sheet feeders and bidirectional tractor feed.

The DWP5155Q costs \$4,500, and the DWP5155SQ costs \$4,900, Tempest said.

Tempest Technologies, 11411 Isaac Newton Sq. S., Reston, Va. 22090.

Soltec Corp. has unwrapped Models 6213 and 6223 two-color Thermal or Ink Writing Strip Chart Recorders, which are one- and two-pen, 250mm chart-width instruments.

The recorders will write a red and black trace on thermal paper at up to 1,200mm/min. Ink pens can also be retrofitted for ink recording.

The 28-speed stepper motor chart drive is reversible and uses Z-fold chart paper. Eighteen input ranges are standard with a maximum sensitivity of 1 mV/250mm with automatic electronic over-range protection. There are also six standard remote control functions: pen lift, chart start/stop, chart speed, external chart drive, chart fast forward and chart reverse.

Prices start at \$1,795.

Soltec, 11684 Pendleton St., Sun Valley, Calif. 91352.

Graphics systems

Spectrographics Corp. has released its Designset family of computer-aided design and manufacturing workstations.

The line consists of three models: the bottom-of-the-line DS 1080 that emulates the IBM 5080 environment, the DS 1500 random-access memory-based system that supports four users and the DS 3000 top-of-the-line stand-alone graphics system.

The DS 1080 supports such applications packages as Cadam, Inc.'s Cadam, Dassault Systems' Catia, Structural Dynamics Research Corp.'s Caeds and Mathematical Applications Group, Inc.'s Synthavision. The DS 1080 starts at \$16,400 with 512K bytes of display list memory and can be expanded to 2M bytes.

The DS 1500 is designed for inter-

active applications for up to four users. It offers IBM 5080 and IBM 3250 emulation. The DS 1500 is said to feature two- and three-dimensional transformations in hardware, real-time clipping and depth cuing; and backface testing. The four-user system costs \$68,600.

The DS 3000 stand-alone system is said to consist of a general-purpose CPU and specialized graphics processors for real-time use. It uses Spectrographics' DSX operating system and supports Spectrographics' Prism operating system. The DS 3000 offers support for as many as four interactive users. A four-user system costs \$96,200.

Spectrographics, 10260 Sorrento Valley Road, San Diego, Calif. 92121.

Apollo Computer Inc. has introduced two workstations, TDN560 and TDN550, designed to meet the U.S. government's Tempest specifications.

The TDN560 and TDN550 color workstations are functionally equivalent to Apollo's standard workstations. They come with either of the company's operating systems, Aegis or Apollo IX. The TDN560 is a color graphics workstation based on the Motorola, Inc. 68020 microprocessor and a Motorola 68881 floating-point coprocessor. The TDN550 color graphics workstation is based on the Motorola 68010 microprocessor and integral floating-point hardware.

Both workstations have an optical interface for constructing an Apollo Domain network. The systems offer 1M byte of display memory, a 19-in. 1,024- by 800-pixel resolution display, a local-area network interface and an RS-232 serial port.

The TDN550 costs \$41,500 for a system with 1M byte of main memory, \$44,500 for 2M bytes and \$47,500 for 3M bytes. The TDN560 costs \$48,500 for a system with 2M bytes of main memory and \$51,500 for 3M bytes of main memory.

Apollo Computer, 330 Billerica Road, Chelmsford, Mass. 01824.

Peritek Corp. has announced graphics cards that plug into Digital Equipment Corp. Microvax II computers.

The firm has released 10 DEC Q-bus color and monochrome cards to produce displays for tasks including engineering, scientific research and medical imaging. The cards are dual-height, and multiple cards can reside in one Microvax chassis to serve multiple displays. Some cards — for example, a color graphics card and an alphanumeric card — can be combined to put both displays on the screen simultaneously.

An alphanumeric card that puts monochrome characters on the screen costs \$615. A \$2,995 card offers 256 simultaneous colors from a pallet of 16 million colors with 512-by 512-pixel resolution. Color cards at lower prices offer 16 or eight colors from a pallet of 4,096. A monochrome card that costs \$2,995 produces dot graphics plus an alphanumeric overlay with 1,024-by 1,024-pixel resolution. A \$1,987 color card designed primarily for process control adds color and character graphics to the on-screen display.

Peritek, 5550 Redwood Road, Oakland, Calif. 94619.

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By watching someone else perform a task?

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COMPUTER INDUSTRY



INDUSTRY INSIGHT
Peter Bartolik
CW News Director

IBM running on Wall Street

Probably not even General Motors Corp. could announce three consecutive quarters of lower than expected profits and still see its stock climb.

But IBM could and did.

After announcing a profit drop of 7% recently, IBM's stock climbed during the next two days of public trading on Wall Street.

There are two possible explanations:

- Wall Street still does not have a firm grip on the computer industry and, therefore, relies for its expertise on IBM's vague comments that it still expects a strong fourth quarter to bring this fiscal year even with last year.

- Wall Street has bought — hook, line and sinker — the expectations of a desperate industry that the announcement of IBM's token-ring local-area network, which came last week, will in itself convince equipment purchasers that the means to integration has arrived and they can now return to the helter-skelter spending of a year ago.

The betting in this corner is that IBM indeed can come out with a tremendously strong fourth quarter that will go a long way toward bringing this year's revenue even with last year's. The company has moved up delivery dates on tons of high-priced equipment and last week announced an average 10% price hike for much of its applications software.

But these are exceptional measures that apply only to IBM and will have little impact on other vendors, unless it

Continued on page 88

Eagle's eye on future; firm planning to soar

By Maura McEnaney

GARDEN GROVE, Calif. — On the day Eagle Computer, Inc. announced fourth-quarter losses of more than \$4.4 million and annual losses of \$10 million, President Gary Kappenman seemed more concerned about tomorrow's prospects than yesterday's losses.

"I expect Eagle to be a \$100 million company within the next 24 to 36 months. If [it's] not, then I haven't done my job and should be replaced," he said.

Kappenman is that confident about his company's rebirth. For more than a year, Eagle has been fighting for its survival in the battle of the IBM Personal Computer-compatible machines.

Beginning with the sudden death of its

president on the very day the company went public in 1983, Eagle has been troubled with its share of problems. A legal challenge from IBM questioned the copyright of Eagle's product line and forced the company to withdraw its product from the retail shelves and change its operating systems. An overly aggressive retail marketing scheme and an overcrowded marketplace also contributed to drastically reduced sales at the high-flying company, which saw \$100 million in sales in 1983.

As a result, Eagle could not repay its long-term creditors, and by the end of 1984, the company teetered on the brink of insolvency. Between fiscal years 1984 and 1985, Eagle lost approximately \$35 mil-

Continued on page 88

BUSINESS NOTES

Finis Connor's reign a memory

Finis Connor's tour of duty as chairman and chief executive officer with Computer Memories, Inc. lasted less than one month. The former co-founder of Seagate Technology, Inc. recently resigned for personal reasons, according to the official word.

David A. Kay was named last week to succeed his father, Andrew Kay, as president of Kaypro. The elder Kay will stay on as chairman of the micro-computer manufacturer.

Continued on page 84

Osborne banks on ventures

By Maura McEnaney

FREEMONT, Calif. — Nine months after emerging from bankruptcy proceedings under Chapter 11 of the Federal Bankruptcy Act, Osborne Computer Corp. is continuing its pursuit of the portable computer market.

Driven from stardom to the depths of failure, the company with the controversial namesake is pursuing new business ventures that it hopes will keep it alive. Today, Osborne is operating with a skeleton staff of 35 workers in 20,000 sq ft of office space — a far cry from the days of \$100 million sales, 1,000 workers and 120,000 sq ft of office space.

In recent months, Osborne announced joint marketing agreements with two small Silicon Valley firms, hoping to expand its

Continued on page 93

INSIDE

Trademark protection /81

Datapoint reported a hefty loss for the year just ended, but its spin-off service division, Intellogic Trace, reported a profit 89

Applied Data Research reported a small third-quarter profit /84

Business is very slow for software and services providers, but the slump in equipment sales may provide profit opportunities, according to a speaker at ADAPSO's recent management conference /87

INSTANT ANALYSIS

"There is, as yet, no evidence of a broad recovery in the U.S. market for computer systems."

— Charles E. Exley Jr.
NCR Corp. president

Trilogy, Elxsi merge; layoffs, losses reported

By Maura McEnaney

SAN JOSE, Calif. — The long-awaited merger between Trilogy Systems, Inc. and Elxsi, Inc. is complete, following the recent approval by shareholders at both companies and regulatory approval.

But news of the merger was overshadowed by Elxsi's simultaneous announcement of 50 layoffs at its manufacturing facilities in San Jose. At the same time, Trilogy announced a \$3 million loss for the third quarter ended Sept. 29 and an additional \$4 million charge against reserves, bringing year-to-date losses to \$14 million.

Founded by mainframe entrepreneur Gene Amdahl in 1980, Trilogy has suffered since it dropped development plans for a fault-tolerant supercomputer last year and scrapped development of a wafer-scale inte-

grated circuit that was planned to be the heart of the IBM plug-compatible system. The move left the company without a significant product line, while at the same time created large cash reserves.

The Elxsi merger, first announced last spring, makes the manufacturer of multiprocessor computer systems an independent subsidiary of parent company Trilogy Ltd. It also gives Elxsi, which recorded \$11 million in losses for the first nine months of the year, much-needed access to Trilogy's \$43 million cash reserve. As part of its preliminary merger agreement, Trilogy has already advanced \$10 million to offset operating costs.

Elxsi shareholders will receive 38 million shares of Trilogy common stock at a value of \$52 million. The stock traded for \$1.37 per share at the time of the announcement.

AMD posts first net loss but reaffirms no-layoff policy

SUNNYVALE, Calif. — Advanced Micro Devices, Inc. (AMD) recently posted its first-ever net loss — laying part of the blame on "predatory pricing" by foreign competition, but the chip maker again said it is committed to a no-layoff policy.

The company, which earlier had announced a mandatory time-off policy [CW, Oct. 14], said it experienced a second-quarter net loss of \$15.3 million, or 27 cents per share, compared with year-earlier profits of \$42.1 million, or 72 cents per share.

The operating loss was much larger — \$29.5 million — but the company was able to draw on tax credits to reduce the deficit. In the first quarter, the company had posted its first operating loss, but tax credits enabled it to post a small net profit.

Revenue for the second quarter was \$128.1 million, only half the

year-earlier level of \$257 million.

AMD's results follow on the heels of a \$3 million loss posted by industry leader Intel Corp. [CW, Oct. 14]. Intel announced it was discontinuing further operating efforts in the manufacture of dynamic random-access memory chips, which comprised only a small share of its total revenue.

AMD said more than half of its operating loss was attributable to operations in the sale of erasable programmable read-only memories, an area company President and Chairman W. J. Sanders said is experiencing "fierce competition combined with predatory pricing from foreign competitors."

Sanders said he believes the worst is over in the industry's recession but added that there is no hard evidence to support expectations of an upturn in the current quarter.

SPECIAL REPORT

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Issue Date: November 25 • Advertising Close: November 8

As corporations continue to expand their computer systems and data bases, the need to secure corporate information is becoming increasingly important. *Computerworld's* November 25 Special Report on Protecting the Corporate Information Resource will address the many complexities surrounding the corporate security issue.

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Our many features and tutorials will explore the importance of audit software, the differences between "hot" and "cold" sites, and methods for securing local area networks — plus creation of a disaster recovery plan and new technologies for determining user authentication. We'll also examine security legislation being studied in Washington and look at the vital roles played by the data processing manager and chief security officer.

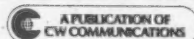
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COMPUTER INDUSTRY

Trademark law protects product names and logos

EIGHTH IN A SERIES

By Jerome J. Roberts
and Michael P. Brownell
Special to CW:

A substantial portion of a vendor's software investment is attributable to marketing expenses intended to inform the market of its software, to differentiate such software from the competition and to establish the reputation of the vendor. Accomplishing these objectives normally requires the establishment of a widely recognized product name and/or logo, usually at considerable expense.

If a vendor follows certain rules regarding the selection and promotion of its product name and/or logo, it will be able to prevent others from using such a name and mark and leveraging off its investment and marketing goodwill. Such protection is the province of trademark law.

Laws exist at both the state and federal levels to protect trademarks, service marks and trade names. This article explains the fundamental aspects of the trademark protection under the federal Lanham Act.

ELIGIBILITY

The mark itself may consist of any visual representation — for example, letters, words, symbols, artistry — subject to several prohibitions. First, a trademark may not consist of other governmental insignia, personal names, portraits or signatures used without a person's consent; any immoral, deceptive or scandalous matter; or any mark that might discourage or falsely suggest a connection with a person or entity.

Second, the mark must not be "generic" or "descriptive," as such terms are defined under trademark law.

Apple Computer, Inc.'s "Apple®" is an excellent mark because its inherent primary meaning, that is, a type of fruit, bears no logical relationship to microcomputers. On the other hand, the hypothetical mark "Spreadsheet" used in connection with licensing a spreadsheet software package probably would be deemed generic and descriptive. However, an otherwise generic or descriptive mark still may receive the act's protection if it acquires "secondary meaning," as defined under trademark law, or if the mark is modified so as to make it distinctive.

The act's third requirement concerning eligibility denies protection to any mark that so resembles a mark that is already being used in the U.S. in connection with similar goods or services that the use of the new mark would confuse or deceive the public.

A thorough investigation can be achieved by performing a trademark search.

In addition to satisfying the act, performing a trademark search prior to using a desired mark can alert a vendor to potential liability for infringing a similar mark already in use.

Roberts and Brownell are attorneys with the law firm of Bermand, Roberts and Kelly in Chicago. The firm's practice deals with legal issues related to procurement, distribution, management and protection of computer resources.

REGISTRATION AND NOTICE

A mark meeting the foregoing requirements may be registered under the act so long as the relevant software has been marketed in interstate commerce under such mark. Trademark registration is more difficult and time consuming than copyright registration, and very often requires the services of an attorney knowledgeable in trademark law.

Once a registration certificate has been issued, the registered mark may be displayed with the registered trademark symbol "®," the words "Registered in U.S. Patent and Trademark Office" or the abbreviation "Reg. U.S. Pat. & Tm. Off." Failure to



so provide notice of registration may cause loss of certain remedies under the act. Such notices may be used only in connection with a mark for which a trademark registration certificate has been issued. Prior to such time, a vendor may use only the symbol "™" to provide notice that a mark is being claimed as a trademark.

INFRINGEMENT

Infringement commonly is described as the attempt of a competitor to use a confusingly similar trademark to palm off his goods as those of the vendor that owns the original mark.

The remedies available under the

act to address infringement include the right to obtain an injunction to prevent or restrain the infringement, the right to recover damages and/or the infringer's profits resulting from the infringement and the right to have infringing articles impounded and/or destroyed.

A certificate of registration is valid for 20 years, provided that after five years the registrant notify the Patent and Trademark Office, in the manner prescribed by the act, that the mark has not been abandoned. Upon the expiration of the 20-year protection period, the owner's registration may be renewed continuously by filing a renewal registration application as required by the act.

PROTOCOL-CONVERTER COMPETITION AGAINST WALL

	WALL DATA DCF 1600	PCI 276	MICOM 74016	LOCAL DATA DataLynx/3274	RENEX RTM 74-16
MULTIPLE CONCURRENT PROTOCOLS OPTION	YES	NO	NO	NO	NO
DIALBACK SECURITY OPTION	YES	YES	NO	NO	NO
DOWNLOAD NEW PROTOCOLS	YES	NO	NO	NO	NO
REMOTE SW DIAGNOSTICS & LINE MONITORING	YES	NO	NO	NO	NO
\$ PER LINE	\$353	\$644	\$332	\$667	\$529

If you're about to sign a purchase requisition for a non-Wall Data protocol converter, it would be in your best interest to throw your pen toward some non-populated area of the office. Trust us. You can retrieve it after you've read this ad.

You have all these ASCII minicomputer terminals and personal computers. Right? And you want them to be able to communicate to a host mainframe or a System 34/36/38, some perhaps over phone lines, in SNA/SDLC, BISYNC, etc. Right? And you've done your homework. Right?

Then ask yourself the same five questions your management and staff are guaranteed to ask you over the lifetime of the product. Over and over again:

1. Can you handle multiple, concurrent protocols to multiple hosts? Not unless your protocol converter is from Wall Data.

2. Is your data secure from unauthorized outsiders who dial in? If your protocol converter doesn't ask for a user's ID and then hang up and call back to the authorized phone number for that user, you're asking for trouble. Why not ask for Wall Data?

3. Can you just download protocol software when new protocols become available? Or when software enhancements are made? You can't with the others.

4. If you suspect there is a problem with either the system software or a data line, can you dial into the protocol converter's console port and do remote diagnostics? Yes, but only with Wall Data.

5. What is the price? Actually, it's quite high...if you aren't dealing with Wall Data. For all the above reasons. Plus the obvious fact that Wall protocol converters are the market price/performance leaders.

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COMPUTER INDUSTRY

Report claims European software market booming

U.S. vendors supply top-selling packages

By Edward Warner

(CWN) — By the year's end, total personal computer software sales in Europe will be double what they were in 1984, according to a recent report from the French market research firm Intelligent Electronics Europe.

The 1.6 million packages that the report predicted will be sold this year in Europe will come mostly from the U.S., the report continued. All of the 10 top-selling packages in Europe, as of July, were published by U.S. ven-

dors, the report said. Heading that list were, in order, such familiar names as Lotus Development Corp.'s 1-2-3, Microsoft Corp.'s Multiplan and Micropro International Corp.'s Wordstar.

Capturing a slice of the lucrative European software pie is not an easy task for U.S. vendors, however.

'Rejection of nontranslated packages'

According to the report, "even in countries where English is widely used and understood in business circles, there is now a very definite rejection of nontranslated packages."

Lotus, for example, once marketed 1-2-3 untranslated but has since established a European headquarters

in the UK where about 30 employees work on adaptations of its products for specific languages and currencies.

In recognition of the difficulty that newcomer U.S. vendors experience when trying to penetrate Europe, Microrim, Inc. late last month announced that it would enter the European market under the wing of Microsoft, a Bellevue, Wash., neighbor.

Microsoft to market R:Base 5000

Microsoft will market Microrim's R:Base 5000 data base management package under a licensing agreement as Microsoft R:Base.

Microrim President Kent Johnson

said his firm turned to Microsoft because he was impressed with Microsoft's experienced, 100-member European marketing group. Microsoft, he said, is the "largest independent U.S. software vendor in Europe."

Microsoft will translate R:Base 5000 into French, German, Spanish, Swedish and Italian versions, to become available next year, and a British-English version, to be available late this year. Pricing was not announced.

Other attractions draw firms overseas

There are other attractions, besides the booming market, that draw U.S. personal computer software companies to Europe. According to the Intelligent Electronics report, "only in the UK and France is there an active horizontal [market] publishing activity" among native developers.

Putting it more bluntly, Lotus international business development manager Stephen Kahn said, "I don't think there's any area [in Europe] that's doing as much software development as [the] whole Boston area."

Microrim's Johnson said he expects Microsoft R:Base to encounter its greatest competition from U.S. products: Ashton-Tate's Dbase II and III lines, a finding borne out by the report.

The Intelligent Electronics Europe report said that the Dbase products were the top-selling personal computer data base management systems in Europe and that, overall, the market for DBMS and spreadsheets showed the greatest growth in Europe in the last year.

The report is based on interviews with more than 200 companies involved in the European software market, including publishers, importers and distributors, and is available from Intelligent Electronics Europe, which is located at 15, Rue Buffon, 75005 Paris, France.

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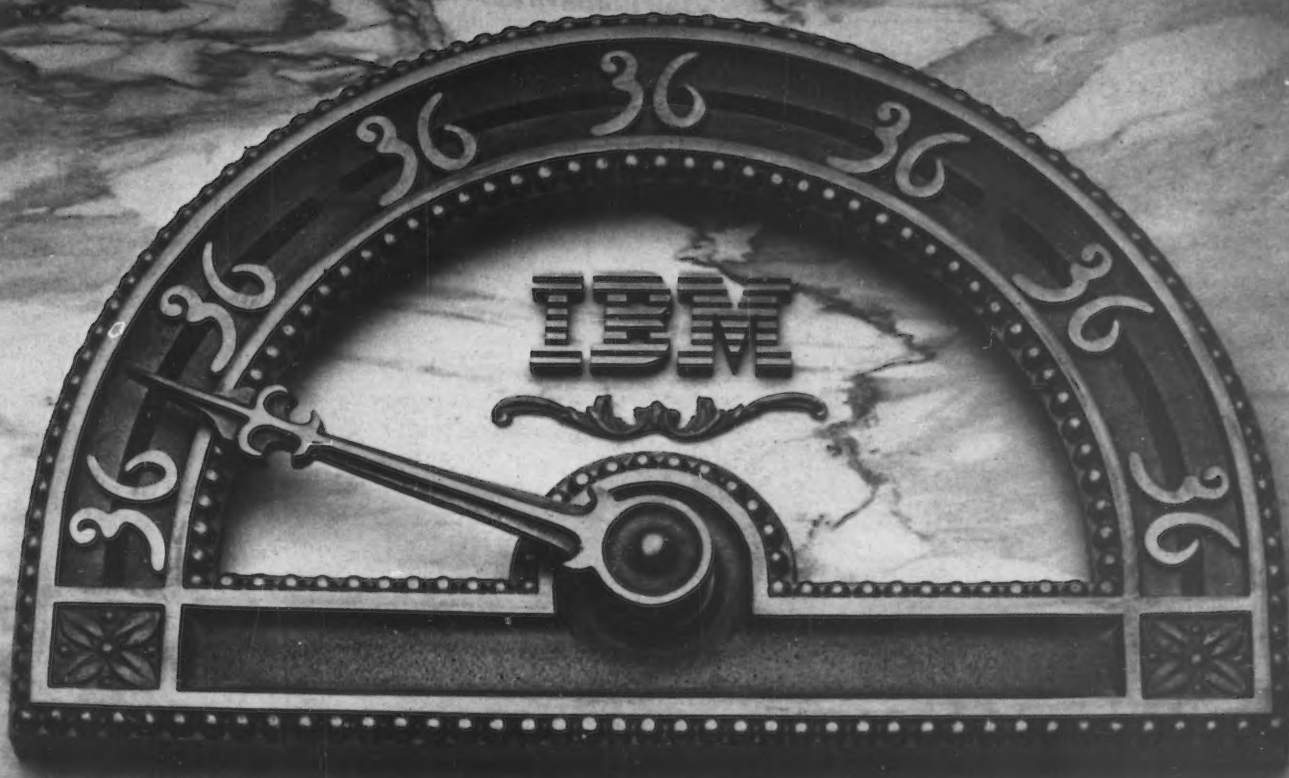
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COMPUTER INDUSTRY

ADR reports third-quarter profit

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) last week reported a third-quarter profit of \$228,000, or 3 cents per share, and said the return to profitability indicates improvement in demand for its products.

For the nine months ended Sept. 30, ADR reported a loss of \$2.3 million, or 37 cents

per share, compared with year-earlier profits of \$4.5 million, or 80 cents per share.

The third-quarter profit was down substantially from the year-earlier profit of \$2.5 million, or 45 cents per share.

John R. Bennett, chairman and chief executive officer of ADR, said an anticipated strong fourth quarter indicates the company will show

a profit for the year.

However, the company declined to make any specific projection due to the current economic climate and uncertainty within the computer industry.

ADR said it will continue to control expenses so as to position itself for the possibility of further economic uncertainty.

From page 79

Finis Connor's reign a memory

Sperry recently agreed to sell its New Holland farm equipment business to Ford Motor for \$440 million. With the anemic division no longer blurring Sperry's vision of the information processing industry, all eyes will be watching to see if the venerable Univac computer line will get yet another master, or if Sperry is indeed intent on

spurning all acquisition offers.

Harris Corp. and 3M Corp. recently announced they will form a joint company to market copiers and facsimile machines.

Measurex Corp. recently signed with Ford to develop jointly a highly flexible computer-integrated manufacturing system for Ford's body and assembly operations. The \$14.4 million program will be aimed primarily at software development.

The American Electronics Association recently came down hard on the current reform package proposed by the U.S. House of Representatives' Ways and Means Committee recently. The association said the package would impose a major penalty tax on research and development activities of high-tech firms.

Ungermann-Bass recently signed a five-year OEM agreement to supply its Personal Network Interface Unit boards to Intel, which will be incorporating them into a product enabling IBM Personal Computer AT and XT models, as well as their compatibles, to communicate with Intel's Opennet local area network.

The computer services industry is continuing to grow with new entrants and with the pace of mergers picking up, according to statistics compiled by the Association of Data Processing Service Organizations/Broadview Associates index. For the first six months of 1985, a total of \$846 million in mergers have taken place, which is a 50% increase over the similar period in 1984.

Broadview Associates, a market analysis firm, estimates that the total number of mergers within the computer services industry will approach 1,500 through the 1980s, and that the total value of the mergers will reach \$20 billion. From 1980 through 1984, the value of mergers totaled \$6.5 billion, according to Broadview.

Broadview said the average dollar value of mergers is \$3 million and that the largest takeover to date is the acquisition of EDS Corp. by GM in 1984 for \$1.1 billion.

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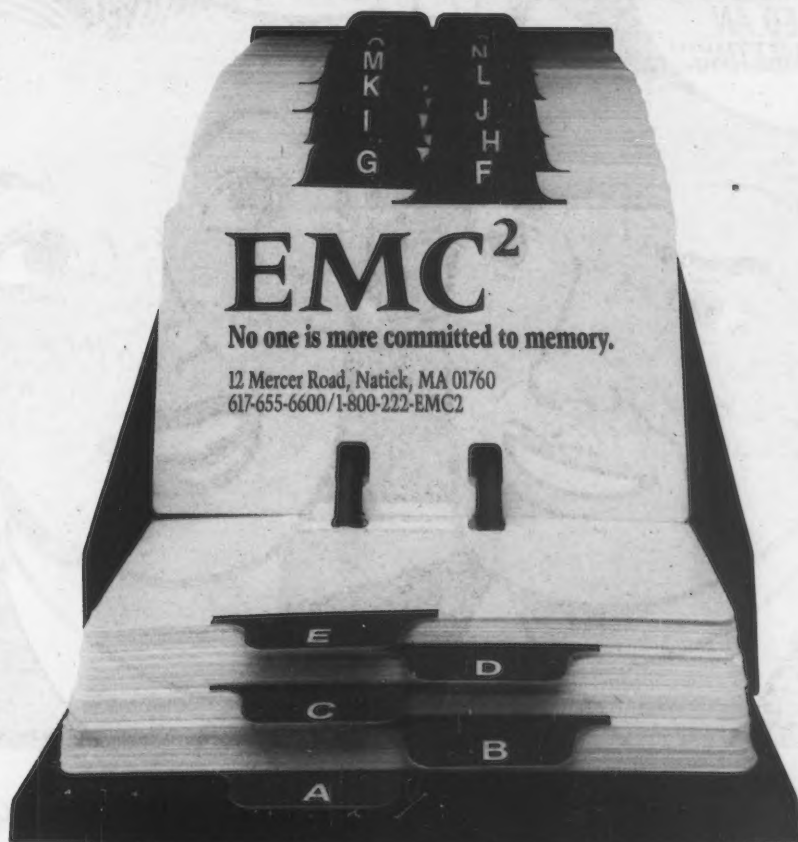
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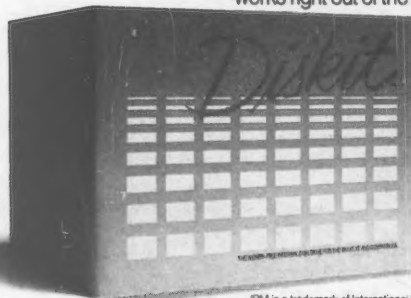
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COMPUTER INDUSTRY

Software firms find new market

By Bryan Wilkins

WASHINGTON, D.C. — Independent software companies, feeling the pinch of a slowdown in hardware sales, can find new opportunities by meeting user demands for systems integration that equipment manufacturers are unable or unwilling to fill.

That was the view offered by Jim Blake, vice-president of business development for Cullinet Software, Inc., at the Association of Data Processing Service Organizations, Inc.'s 64th management conference held recently.

"Things are very tight, very tight," Blake conceded during a meeting on systems integration. But, he said, independent software vendors are looking at new market opportunities represented by the retrenchment of hardware vendors that have cut back their sales forces and are now approaching software companies for assistance.

Blake said customers are adopting a very cautious stance on buying software packages. Potential users subject products to extensive analyses to determine their possible shortcomings and their ability to change with the needs of the business.

"It seems like [users] are demanding the ability to put all their systems together into one information center-type approach and at the same time are demanding an ability to perform distributed processing from their micros, minis and mainframes," he added.

Software vendors are facing customer dissatisfaction with existing micro-mainframe packages that are now in wide use in businesses. This dissatisfaction is due to limitations on uploading data to the mainframe, Blake said.

But software applications that distribute data from mainframes among micro users and within local-area networks are not as advanced, and the problems appear harder to solve, according to Blake. This is because the problems stem from issues such as incompatibility of hardware, software and communications protocol links, which then affect backup and recovery planning if an applications package is tailored for a specific solution.

"No one has solved these problems yet, though everyone is trying hard," Blake said. In this way the popularity of relational technology and referential integrity — the ability to update data with direct reference to establishing that the initial data was in the correct format — can be explained. Relational data base packages and SQL-type packages are helpful, but they are ham-

pered by lack of support from hardware manufacturers, Blake said.

IBM, according to Blake, has expressed an unwillingness to produce a referential integrity type of package in the next two to four years. This, coupled with the lack of a communications protocol in the IBM Systems Network Architecture LU6.2 product,

Blake asserted, creates "a severe problem."

The current equipment sales slowdown and users clamoring for a transparent applications package that allows them to communicate and manipulate mainframe data from their micros present an opportunity for independent software firms to fill the demand, Blake said.

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COMPUTER INDUSTRY

From page 79

Eagle's eye on future; firm planning to soar

lion. Layoffs trimmed the Eagle staff down to 65 from 330, and all operations were consolidated to the Garden Grove offices.

Kappenman, however, said he believes Eagle has learned from all its troubles and is about to leave its problems behind.

While it registered its \$10 million loss, Eagle laid the groundwork for what it said it hopes will be its resurgence in the computer market.

Without seeking the protection of the courts, Eagle reorganized and, by August, established a repayment plan for its long-term debtors (CW, Sept. 30). It initiated manufacturing operations in Seoul, South Korea; added 10 million shares of stock to its

holdings; recruited a new chief operating officer; increased its field sales force; refocused its market; and readied itself for a new line of products.

Critical to Eagle's attempted flight from the ashes is the success of the SST, a multiuser supermicro scheduled to debut at November's Comdex.

Some analysts say the SST is just what Eagle needs to make it airborne. "Multiuser systems could be a smart move for [Eagle]," said Maureen Fleming, president of Digital Information Group in Stamford, Conn.

IBM's System/36 PC is far too expensive, has limited dealer channels and is not considered to be a mainstream product, Fleming said.

To be successful, Eagle must put some money behind its marketing efforts — hence the need for more stockholdings, Eagle officials noted — and the SST must work with the

top word processing and spreadsheet packages, she noted. Eagle has not released any SST specifications.

With Eagle's new product will come a new marketing emphasis, Kappenman said. The company will try desperately to avoid repeating one critical mistake of years ago. "In the clamor to get onto the retail shelves, we lost some of our identity," Kappenman said. Eagle will now focus on selling new customers solutions to both new customers and its established base of more than 45,000.

"Our marketplace is the small marketplace — it always was," Kappenman said.

With the SST will come a slower, more sophisticated approach to its market. "If we try to get billions of dollars of business, we are going to fail," Kappenman said.

Analysts like Fleming have said

they have difficulty believing that Eagle does not want the big market right away. "Comdex is an expensive show, and it's for retailers, so I'm sure they are going for the glamour market," she said. It is possible Eagle could pit itself against firms producing Microsoft Corp. MS-DOS-based machines that can be networked together. "You don't usually have a Comdex launching if you are going to try and limit yourself to the small business market," she said.

Big market or small market, Kappenman and Eagle's management still are playing for some heavy stakes. And they are convinced theirs will be one of the few companies that can be down but can come up swinging. In fact, the tough guy image is one preferred by Kappenman and his management team. "People like a tough company and a management team that doesn't give up," he said.

Whether or not Eagle will reinstate faith in the storybook ending remains to be seen. But don't try to convince Kappenman that it cannot be done. "We were once considered a Cinderella story. Now we're more like Rocky, coming back to fight the challenge," he said.

From page 79

IBM running on Wall Street

depresses the demand for Sierra-like products announced by the plug compatibles.

But let's look down the road: If IBM sells a bunch of Sierras this year, the machines can only be coming from next year's projected sales. Even if the backlog stretched into 1987, the demand for IBM's biggest machine is still limited by the relatively limited market for them. Only a certain percentage of IBM 3080-class users can afford or use the power of the IBM 3090 models; this market is not, after all, dealing in personal computers that cost only \$3,000 or so.

At some point, IBM's decision to move up its projected revenue stream has to be felt when demand stabilizes.

So why would Big Blue optimize short-term results at the expense of long-term health?

It just may be that IBM's large staff of economists has come to the conclusion that the U.S. economy at this point in time cannot deal with adverse news from the largest vendor in the fastest growing industry.

If IBM were to concede temporary defeat this year, its stock would take a hit. IBM could deal with that, but the action would surely pull down the rest of the high-tech stocks. And there is some reason to believe that high-tech industries are leading indicators of the economy these days, so the further impact could be to pull down the stock markets broadly. That would severely undermine confidence in the U.S. business climate and possibly could tip a feeble economy over the edge into a quicker than expected recession, setting off an even more severe cycle.

It just may be that IBM has become so huge that it no longer can make decisions based solely on its own goals, but it must also shoulder responsibility for propping up the U.S. economy. If so, one can expect that IBM President John Akers will age as quickly in his job as Jimmy Carter did in his post.

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MULTIPAK/VM was written to assist users at all levels of experience. The package offers a trove of features that will benefit the most experienced VM/CMS programmer as well as the non-technical, inexperienced VM user. In fact, we developed MULTIPAK/VM for our own use based upon our years of IBM and VM experience from our ACF2 product line. SKK is a leader in IBM mainframe software products, with over 1,600 user sites worldwide.

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Spool Viewer offers user-tailorable screens, which may also be used to change the displayed data. The Display/Change feature enables users to change file attributes by simply keying-over the displayed data without using complex CMS commands.

2. SHORT CUT

Short Cut is a command shell which simplifies CMS by guiding users through a multilevel system of command panels. Short Cut is designed to reduce the CMS learning curve and to increase efficiency of experienced users by offering simpler, faster alternatives to existing facilities.

Managers may use Short Cut to restrict CMS command usage by specific groups of users or by individuals.

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Screen Painter enables users to construct full-screen application panels by laying out screens exactly as they are to appear. Screen Painter offers new levels of performance, while automatically validating all screens and allowing users to print screen hardcopies. These screens may be called from an assembler program, and EXEC, or a high-level language.

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**The time has come
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"The only reason to buy a database management system is to build better applications."

Throughout the history of the software industry, proponents of one database architecture after another have promoted their respective systems as the sole solution to a company's application backlog problem.

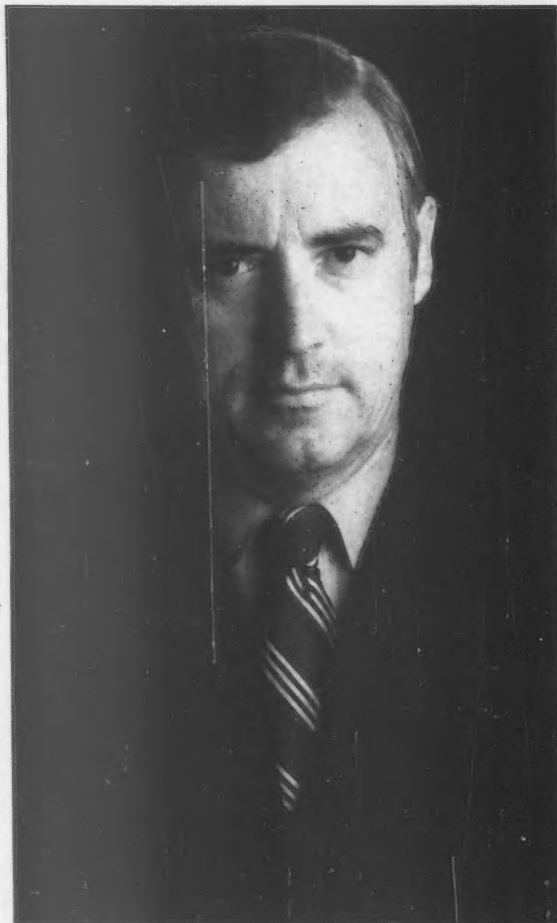
The early debate centered on hierarchical versus network architecture. Advocates of inverted file entered the argument in the 70's. And today, relational is the architecture of choice.

While this discussion about architecture is interesting, it's just not the issue.

Database management systems, beginning with the very first, were created to do one thing and one thing only—they were created to build better applications. *Building applications—efficient, online applications, faster, with fewer people—is the only real issue.*

Today corporations have a huge backlog to contend with. And the applications they need to develop have different characteristics. Some may be retrieval only. Some may be heavy on update. Some will run the company, and will require professional development. Some can be created by end users to satisfy their own needs.

It is extremely important to have a database



management system that can handle all applications. *It is essential* that a database include tools rich and comprehensive enough to accommodate both the professional developer and the end user. It's the richness and power of these tools that's critical to the successful implementation of highly responsive fourth generation applications. What's demanded, in fact, is software that goes a *step beyond* today's conventional relational database systems.

With a comprehensive database management system and the appropriate tools like the kind I'm talking about, you'll make the data processing department a *strategic asset* instead of corporate overhead. You will make your company succeed in a highly competitive world.

In Cullinet's new Annual Report, Presidents and CEO's of major corporations speak about the positive impact Cullinet has had on their operations. For a copy that you might like to read and pass along to your company president, write to me. I'll see that you get one.

A handwritten signature in dark ink, reading "J. Cullinane". The signature is fluid and cursive, with a large initial "J" and "C".

John J. Cullinane
Chairman of the Board

The only database management system worth buying is one that meets these six requirements.

Stated simply, IDMS/R is a step beyond today's conventional relational DBMS because it meets these key requirements for building successful applications.

1. **MIS Application Development Facilities**

The application development system required to build high performance production applications requires more than a fourth generation language. Cullinet's ADS/OnLine is a comprehensive application development environment for the MIS professional combining fourth generation language with a menu-driven modular development approach. Integrated with the data dictionary, this minimizes not just the programming but the entire design, development and documentation of an application. Furthermore, this approach produces a dramatic reduction in maintenance and support.

2. **End-User Application Development Facilities**

Because Cullinet recognizes the difference between production and end-user applications, as well as the need for both to share common data, we provide an easy to use end-user oriented development and inquiry system. The Automatic System Facility of IDMS/R is a non-procedural, menu-driven tool designed for end-users. Once data tables are defined, an application is automatically generated. The query facility of IDMS/R provides menu-driven query capability and full online help, so end-users can build working applications in minutes and get reports easily and efficiently.

3. **Relational Architecture**

IDMS/R allows for the definition of databases using the relational data model. Data tables and associated user views are easily defined online. Additionally, any number of key fields may be defined. IDMS/R also supports advanced relational features including referential integrity and domain

definition. This architecture provides the capability to address all application requirements.

4. **High Performance Database and Application Tuning Facilities**

IDMS/R is a full multi-tasking, multi-threaded system providing for concurrent processing of on-line and batch, update and retrieval applications. Additionally, tuning facilities provide efficient indexing techniques, space management, page management, and buffer management. No conventional relational DBMS has these capabilities.

5. **Dictionary Driven DBMS**

Data integrity and data independence are essential in a DBMS environment. The dictionary actively controls the source and use of all data. Data definitions, data validation criteria, data formats and security are all defined within the dictionary and exist only once, eliminating redundancy and ensuring integrity. This information is then automatically used throughout the system. Examples of the functionality of this facility include never needing to define output formats for query; never needing to define field attributes for screens; never needing to code validation and editing criteria when using ADS/OnLine. Only IDMS/R provides this level of dictionary integration.

6. **Open System Architecture**

With the unique Open System Architecture of IDMS/R you can maximize your investment in existing software. IDMS/R accepts data from outside the database environment with direct access to VSAM files. In addition, applications written to access other databases like IMS, DL/I, TOTAL, or VSAM can directly access IDMS/R without modification. IDMS/R is designed to work in virtually all IBM mainframe operating systems and teleprocessing monitor environments.

IDMS/R: More than a relational DBMS

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COMPUTER INDUSTRY

Datapoint reports loss while spin-off Intellogic posts profits

SAN ANTONIO — Datapoint Corp. recently reported a net loss of \$48.2 million, or \$2.61 per share, for the year just ended, but the service unit that spun off it as an independent company, Intellogic Trace, Inc., reported profits of \$20.2 million, or \$1.09 per share.

Revenue for the year was \$520 million, compared with \$600 million a year earlier. Profits in the previous year were \$28.1 million, or \$1.29 per share.

Excluding the contribution of the service unit, revenue for Datapoint was \$380.3 million.

In the fourth quarter, Datapoint

posted a loss of \$5.8 million, or 32 cents per share, including the effects of a one-time charge of \$6.5 million resulting from the settlement of litigation.

According to the company, a year earlier it reported fourth-quarter profits of \$5.5 million, or 27 cents per share.

Intellogic Trace said its profits for the previous year, based on adjustments and assumptions related to its former status within Datapoint, would have been \$14.7 million, or 79 cents per share. Revenue for the year just ended was \$158.5 million, compared with last year's \$144.3 million.

From page 79

Osborne banks on ventures

product line and give it more exposure in the retail market. The company put out a \$3 million stock offer this summer, reduced its debt from \$15 million to \$6 million and is seeking additional financing of \$4 million to \$6 million for 1986 operations.

In August, Osborne signed an agreement with Sona Computers, Inc. of San Jose. The research and development company is designing a 16- to 18-lb machine that will be compatible with the IBM Personal Computer.

Dubbed the Osborne Voyager, the 16-bit machine is expected to be introduced early next year and will cost less than \$1,500, according to Osborne President Ronald Brown, former vice-president of the firm's international division, who took over after Osborne filed for bankruptcy two years ago. The company expects to ship between 10,000 and 12,000 Voyager units next year, he said.

To enhance its presence in the retail market, Osborne announced last month an agreement with San Diego-based Tigermark Corp., the manufacturer of a security board for the IBM Personal Computer. The product is now available for Osborne's Vixen portable, introduced last year.

Tigermark also manufactures peripherals for Apple Computer, Inc. products and is said to have a strong presence within domestic computer retail markets. The agreement makes Tigermark a U.S. distributor for Osborne, which will then sell Tigermark products through its established international distribution channels, Brown said.

These two deals are just the beginning of what could be several relationships for Osborne, according to Brown, who would not rule out the possibility of a merger with these or other companies. "We could put together three or four of these kinds of deals," in an effort to beef up its product line, he said. Future products could include an IBM Personal Computer XT- or AT-type system, an AT&T Unix-based system or even Apple-compatible products, Brown noted.

Even with the new product line, Osborne remains committed to the CP/M operating system, installed in early Osborne I and Executive portables. "There is an installed base of one million computers out there," Brown said. "That market isn't growing, but it's not going away."

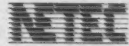
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SAS Institute Inc. Announces

Lattice C Compilers for Your IBM Mainframe

Two years ago...

SAS Institute launched an effort to develop a subset of the SAS® Software System for the IBM Personal Computer. After careful study, we agreed that C was the programming language of choice. And that the Lattice® C compiler offered the quality, speed, and efficiency we needed.

One year ago...

Development had progressed so well that we expanded our efforts to include the entire SAS System on a PC, written in C. And to insure that the language, syntax, and commands would be identical across all operating systems, we decided that all future versions of the SAS System—regardless of hardware—would be derived from the same source code written in C. That meant that we needed a C compiler for IBM 370 mainframes. And it had to be good, since all our software products would depend on it. So we approached Lattice, Inc. and asked if we could implement a version of the Lattice C compiler for IBM mainframes. With Lattice, Inc.'s agreement, development began and progressed rapidly.

Today...

Our efforts are complete—we have a first-rate IBM 370 C compiler. And we are pleased to offer this development tool to you. Now you can write in a single language that is source code compatible with your IBM mainframe and your IBM PC. We have faithfully implemented not only the language, but also the supporting library and environment.

Features of the Lattice C compiler for the 370 include:

- **Generation of reentrant object code.** Reentrancy allows many users to share the same code. Reentrancy is not an easy feature to achieve on the 370, especially if you use non-constant external variables, but we did it.
- **Optimization of the generated code.** We know the 370 instruction set and the various 370 operating environments. We have over 100 staff years of assembler language systems experience on our development team.
- **Generated code executable in both 24-bit and 31-bit addressing modes.** You can run compiled programs above the 16 megabyte line in MVS/ESA.
- **Generated code identical for OS and CMS operating systems.** You can move modules between MVS and CMS without even recompiling.
- **Complete libraries.** We have implemented all the library routines described by Kernighan and Ritchie (the informal C standard), and all Gie library

routines supported by Lattice (except operating system dependent routines), plus extensions for dealing with 370 operating environments directly. Especially significant is our byte-addressable Unix-style I/O access method.

- **Built-in functions.** Many of the traditional string handling functions are available as built-in functions, generating in-line machine code rather than function calls. Your call to move a string can result in just one MVC instruction rather than a function call and a loop.

In addition to mainframe software development, you can also use our new cross-compiler to develop PC software on your IBM mainframe. With our cross-compiler, you can compile Lattice C programs on your mainframe and generate object code ready to download to your PC. With the cross-compiler, we also offer PLINK86™ and PLIB86™ by Phoenix Software Associates Ltd. The Phoenix link-editor and library management facility can bind several compiled programs on the mainframe and download immediately executable modules to your PC.

Tomorrow...

We believe that the C language offers the SAS System the path to true portability and maintainability. And we believe that other companies will make similar strategic decisions about C. Already, C is taught in most college computer science curriculums, and is replacing older languages in many. And almost every computer introduced to the market now has a C compiler.

C, the language of choice...

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Bring the Universe down to Earth

SPACE TELESCOPE

The Hubble Space Telescope is an orbiting astronomical observatory to be launched by Space Shuttle in 1986. Space Telescope Science Institute will conduct the scientific operations of the telescope, which has a planned 15 year scientific mission.

At launch the Institute's computing systems will amount to a half-million lines of code written in C, FORTRAN, VAX/11 Macro, OPS5, LISP, and Scan, as well as three critical databases and a data archive. The system is distributed over a dozen CPUs at two sites and is networked to other mission operations systems located at Goddard Space Flight Center.

Space Telescope Science Institute, an astronomical research center operated by AURA for NASA, is assembling a team of S/W experts - dedicated, motivated individuals who will take responsibility for the future growth of a major computing facility. This team will be responsible for systems now under development and will work with operators and astronomers to define and implement the next generation.

We have immediate openings in the following areas:

• OPTICAL DISK ARCHIVE

STScI is building an optical disk based data management facility to provide an on-line archive of astronomical data. Current optical disk jukebox technology will be employed in conjunction with a relational database machine to provide both archive and catalogue services to scientists analyzing data. The system will serve a variety of networked processors, both local and remote.

• NETWORK/UNIX SPECIALIST

STScI is developing an extensive network of VAXes, SUNs, and image processing workstations to support data analysis and scientific computing. We are looking for a key individual with several years experience in this area to spearhead this effort. We are currently using TCP/IP and DECnet on Ethernet; plans call for higher bandwidth installation of fiber optic media and exploration of wide-area network options.

• SCIENCE MISSION PLANNING

The science planning system is responsible for planning and scheduling all Space Telescope science operations, including the generation of optimal spacecraft activity timelines and command sequences to execute them. This system involves a wide variety of computing subfields and languages.

• REAL-TIME SUPPORT

This real-time system manages minute-by-minute spacecraft operations, including target acquisition, real-time decision making, and the first look at the data. This system monitors critical instrument status data and must be online around the clock.

• PIPELINE DATA PROCESSING

This system operates the Space Telescope data pipeline, in which a huge volume of data must be reliably calibrated, archived, and made available to the international astronomical community on a variety of distribution media.

• GUIDE STAR SELECTION SYSTEM

In order to position the telescope for each observation, a pair of appropriate reference stars must be extracted from an all-sky catalog of 40 million stellar objects. This system will generate and maintain the catalog and will process requests for guide star pairs.

• SYSTEM ENGINEERING AND SUPPORT SOFTWARE

These staff members will be responsible for system support and cross-system integration, involving the ground support subsystems, the data archive, the operational databases, local and remote networks, and other Institute facilities.

• SCIENTIFIC DATA ANALYSIS

STScI is developing a large body of astronomical data analysis software to reduce Space Telescope data. This software will support the astronomical components of the operational systems, as well as the interactive data analysis and image processing systems utilized by the astronomers.

• REVISION CONTROL

These staff members will be in charge of development of build procedures, build generation, and installation validation for operational system upgrades. Extensive use will be made of automated tools for build generation, version tracking, and regression testing.

All positions require experience in large scale software engineering, and will put you right where the action is. Previous spacecraft experience is not necessary, but experience in several of the following areas is desirable:

- Knowledge-based planning & scheduling
- Parsing and code-generation, Combinatorics;
- Systems programming, Networking, Multiprocessor distributed systems; Command languages;
- Real-time systems;
- Scientific computing, Image processing & computer graphics, Computational geometry, Numerical analysis, Algorithm development;
- Relational and hierarchical databases, Hardware database mgmt. systems.

Languages and operating systems used include:

- C, FORTRAN, LISP, OPS5, Scan, VAX/11 Macro;
- UNIX and VMS.

STScI offers an atmosphere of intellectual stimulation and reward, and a competitive salary and comprehensive benefits package in a university campus setting. If you would like the opportunity to make a contribution to one of the most exciting scientific enterprises of the decade, please forward your resume and a portfolio of your work to:

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All applications/resumes should reference position #17593 and must be received by November 8, 1985. Reply to:

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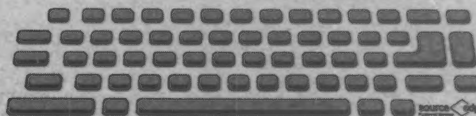
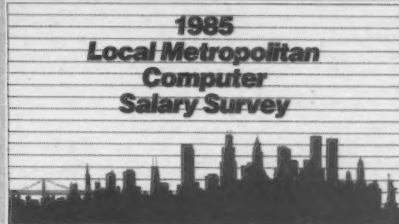
shows salaries across North America

The new, **1985 Local Metropolitan Computer Salary Survey** is now available absolutely no cost or obligation to you.

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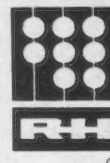
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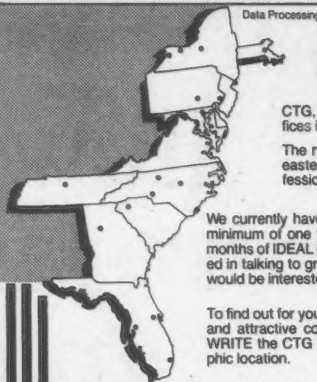
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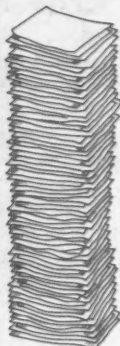
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